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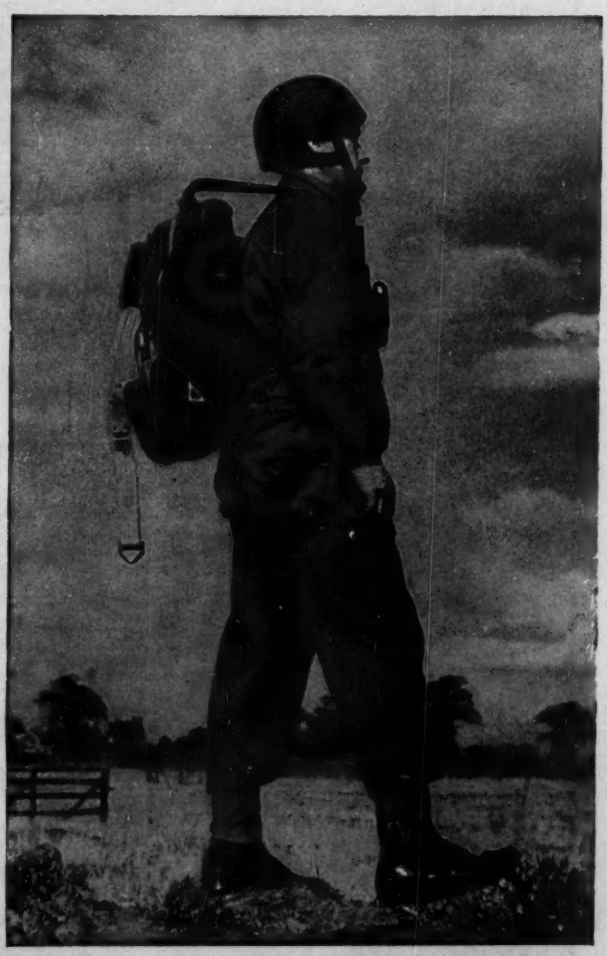

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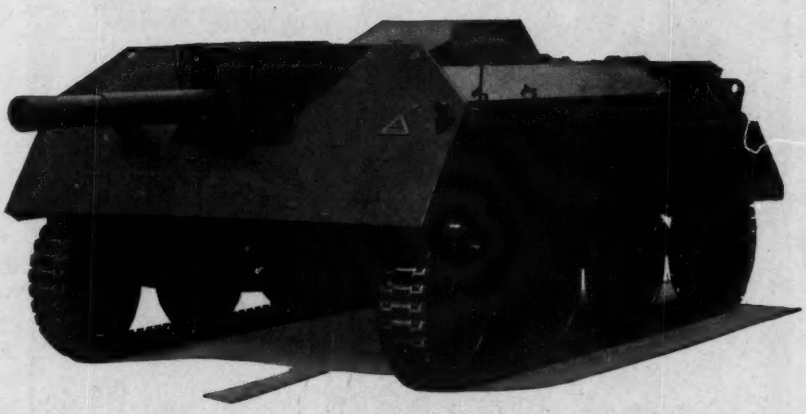

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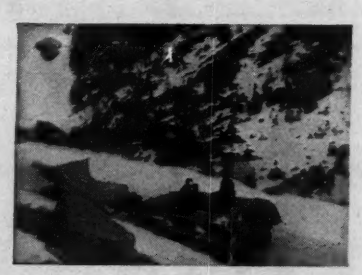

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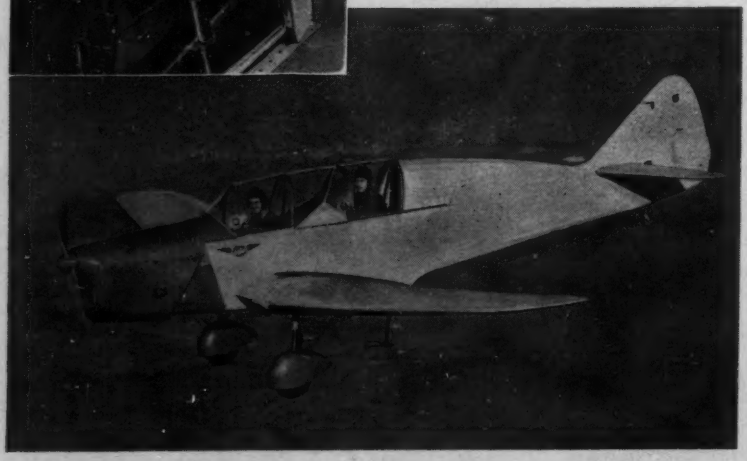

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General Sir William J. Slim, G.B.E., K.C.B., D.S.O., M.C., has accepted the invitation of the Council to be one of their ex-officio Members, on succeeding Field-Marshal the Viscount Montgomery of Alamein, K.G., G.C.B., D.S.O., as Chief of the Imperial General Staff.

Rear-Admiral G. N. Oliver, C.B., D.S.O., has accepted the invitation of the Council to be one of their ex-officio Members on succeeding Vice-Admiral Sir Patrick Brind, K.C.B., C.B.E., as President of the Royal Naval College, Greenwich.

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Group Captain K. R. Coates, R.A.F.
Flight Lieutenant W. J. Dunn, R.A.F.
Squadron Leader R. J. Tilley, R.A.F.
Squadron Leader I. G. Broom, D.S.O., D.F.C., R.A.F.
Flight Lieutenant K. B. Crosby, R.A.F.
Squadron Leader T. H. Sproulle, D.F.C., R.A.F.
Wing Commander R. H. E. Emson, C.B.E., A.F.C., R.A.F.
Flight Lieutenant R. L. S. Coulson, R.A.F.
Squadron Leader A. S. Mohan, R.A.F.
Flight Lieutenant W. H. Palmer, R.A.F.
Squadron Leader V. R. Marshall, R.A.F.
Wing Commander R. W. Hase, R.A.F.
Flight Lieutenant R. Bruce Wallace, R.C.A.F.
Flight Lieutenant A. J. J. Kirk, R.A.F.
Squadron Leader L. B. Fletcher, R.A.F.
Flight Lieutenant F. G. Fray, D.F.C., R.A.F.
Squadron Leader A. C. Marfleet, R.A.F.
Flight Lieutenant J. G. Kendall, R.A.F.
Squadron Leader P. F. Steib, D.F.C., R.A.F.
Squadron Leader F. R. Bird, D.S.O., D.F.C., R.A.F.
Flight Lieutenant R. L. Easterbrook, R.A.F.
Flight Lieutenant M. J. O'Bryen Nichols, R.A.F.

INCREASE OF SUBSCRIPTIONS

As from the 1st January, 1948, the rates of subscription were increased to: —

Annual Subscription	£1	10	0
Life Subscription	£24	0	0
or four yearly instalments of	£6	6	0 each
Covenanted Life Subscription—Seven yearly instalments of	£3	12	0 each

Annual Members who have not yet instructed their banks are requested to do so without delay. If they ask, they can be supplied with new bankers orders, in which event they are requested to send the requisite remittance to make up the amount due for the current year at the same time.

Members who are in process of paying their Life Subscriptions by yearly instalments are not called upon for any increase.

COVENANTED SUBSCRIPTIONS

The Council hope that many more Members will support the Scheme for Covenanted Subscriptions, details of which have been circulated to all Members.

This materially assists the Institution because it enables Income Tax at the full current rate to be reclaimed on each subscription.

To date 1,266 Annual and 561 Life Members have signed the necessary Deeds.

Any Member who has not received his copy of the Scheme or who requires new forms is requested to communicate with the Secretary.

LIAISON OFFICERS

The following changes have taken place in the list of Liaison Officers published in last quarter's JOURNAL :—

NAVY

Establishment of Command	*Name*
Royal Marines, Chatham...	Lieut.-Colonel J. M. Phillips, R.M.

ARMY

A.A. Command	Lieut.-Colonel H. C. Withers, M.C., R.A.

CORRECTION

Combined Operations Headquarters	Lieut.-Colonel G. J. Burgess-Winn, O.B.E.

TRENCH GASCOIGNE PRIZE ESSAY COMPETITION, 1948

The following essays have been received :—

1. " Ichabod."
2. " Valour that parleys is near yielding."
3. " Let us hear the conclusion of the whole matter : Fear God and keep His commandments, for this is the whole duty of man."
4. " Tria Juncta in Uno."
5. " Vis Consili Expers Mole Ruit Sua."
6. " When their Judges are overthrown in stony places they shall hear my words."
7. " Strike hard—strike sure."
8. " Arma Virumque Cano."
9. " Si Vis Pacem, Para Bellum."
10. " All Wisdom is not New Wisdom."
11. " Facilis descensus Averno.

MUSEUM

GIFTS

Sword of an Artillery Officer, 1861 (9382), by Mrs. A. C. Woods.

Replica of the Royal Humane Society's Stanhope Gold Medal (9383) by the Committee, Royal Humane Society.

Replica of the Silver Hand, captured by the Poona Horse at the Battle of Khusab, Persia, 8th February, 1857 (9384), by the Officers of The Poona Horse.

Flag of Admiral Sir Lewis Bayly, K.C.B., K.C.M.G., C.V.O., which he flew on more than one occasion in U.S.S. " Cushing " in 1817 (9385), by Mrs. David Hanrahan.

A Pen and Pencil used by the Duke of Wellington, presented to Lieut.-General Sir George Brown, G.C.B., K.H., by the Duke of Wellington's son on 7th August, 1855 (9386), bequeathed by the late Sheriff George Brown.

Undress Tunic of 12th Royal Lancers, frock-coat and shabracque, period 1900 (9387), by the Officers of the 12th Royal Lancers.

Jacket, overalls and busby with plume of the 3rd City of London Yeomanry (Sharpshooters). The Commemorative medal of Inigo Jones (9388), by Mrs. F. W. G. Brownlie.

One of the last buttons left on the tunic of Colonel R. Martin, 21st Lancers, after he had come through the Charge of Omdurman on 2nd September, 1893 (9389), by his goddaughter, Mrs. Barton-Smith.

The personal sword of Lieut.-Colonel Sir James Skinner, C.B. (9390), by the former Officers of Skinner's Horse.

Lucknow Medal with clasp of the " Relief of Lucknow " awarded to the Rev. P. W. Kellner, officiating Chaplain (9391), by Mrs. Parker-Brewis.

The Orders, Decorations and Medals of Field-Marshal the Earl Roberts of Khandahar. V.C., K.G., K.P., G.C.B., O.M., G.C.S.I., G.C.I.E.

Also of his father—General Sir Abraham Roberts, G.C.B.

Also of his son—Lieutenant the Hon. F. Roberts, V.C.

Also of his son-in-law—Brigadier-General Lewin, C.B., C.M.G.

Also of his wife—The Countess Roberts, C.I.

Also of his elder daughter—The Countess Roberts, D.B.E.

Three Presentation Swords given to Field-Marshal the Earl Roberts by—

1. City of London.
2. City of Portsmouth.
3. Cape Town.

Field-Marshal the Earl Roberts' Banner of the Garter.

All the above (9392) given by the Countess Roberts, O.B.E.

JOURNAL

Members are invited to offer suitable contributions for the JOURNAL. Confidential matter cannot be used, but there is ample scope for professional articles which contain useful lessons of the War; also contributions of a general Service Character, such as Strategic Principles, Command and Leadership, Morale, Staff Work, Naval, Military and Air Force history, customs and traditions.

The Editor is authorized to receive articles from serving officers, and if found suitable to obtain permission for their publication from the appropriate Service Department.

Army Officers are reminded that such articles must be accompanied by the written approval of the author's Commanding Officer.

REQUEST FOR BACK NUMBERS

The Editor will be grateful for any copies of the JOURNAL for August and November, 1947, and February, 1948, with which Members may have finished, in order to meet applications for these numbers.

CHANGES OF ADDRESS

Members are particularly requested to notify any change of address which will affect the dispatch of the JOURNAL.

Naval Officers' Addresses

Naval Officers are strongly advised to keep the Institution informed of their address as JOURNALS sent to them via C.W. Branch of the Admiralty are invariably greatly delayed.

FOR SALE

THE NEW NAVAL SIGNAL CODE

A limited number of spare copies of the frontispiece of this JOURNAL are available to members at 1/- each, post free.

"WHAT TO READ"

The articles on "What to Read," which have appeared in the JOURNAL, have been brought up to date and published in pamphlet form. Copies can be supplied, price 1s. 6d., post free.

THE UNVEILING OF THE JELLICOE AND BEATTY MEMORIALS

The following address was delivered by H.R.H. The Duke of Gloucester when, on 21st October, 1948, he unveiled the two busts on the North side of Trafalgar Square which are the Memorials to Admirals of the Fleet the Earl Jellicoe, G.C.B., G.C.V.O., O.M., and the Earl Beatty, P.C., G.C.B., G.C.V.O., O.M.

"IT is an honour to me, as a soldier, to be asked to unveil this Memorial of two great sailors.

"Lord Jellicoe joined the Navy in the days of sail. Forty years later, at a supreme crisis in our history, he was called to command the greatest concentration of sea power which the World had ever seen.

"In those forty years, before the coming of aircraft, the change from sail to steam had so quickened the conduct of war at sea that when he assumed command there was placed upon his shoulders a personal responsibility, day by day, the like of which has been borne by no other man in the history of war. A statesman wrote of him at that time 'Jellicoe was the only man on either side who could lose the war in an afternoon.'[1] He did not fail us.

"After the Armistice, and after many years as the beloved Governor-General of New Zealand, he came home to succeed Lord Haig in the British Legion. Countless ex-Servicemen are grateful for his goodness of heart, and for the selfless devotion of the last years of his life.

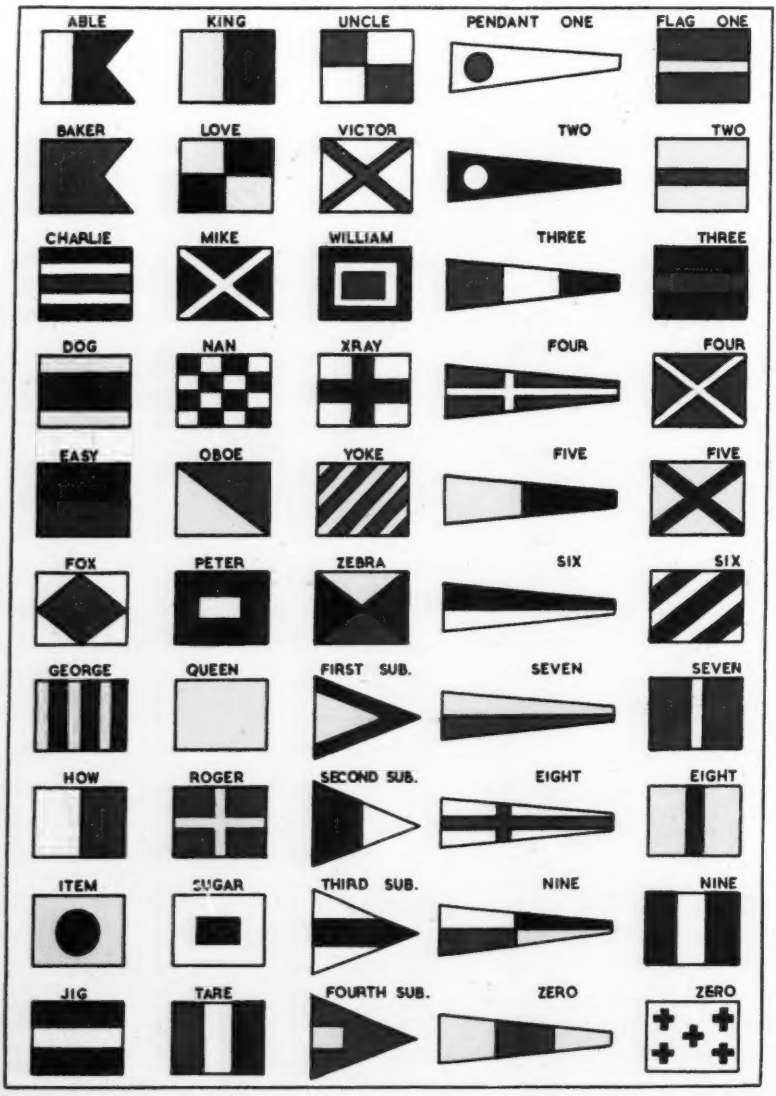
"Lord Beatty was his great fighting subordinate. He was the youngest Admiral since Nelson, and he will always be remembered for his command of the battle cruisers—in those days the cavalry of the Fleet—at the Battles of Heligoland, The Dogger Bank, and Jutland.

"When Jellicoe went to the Admiralty, Beatty succeeded him as Commander-in-Chief of the Grand Fleet, and so in his hands lay our defence upon the sea during the last two years of the First World War. Then he, too, became First Sea Lord. He held that great office for longer than any other man has done in modern times, and it was he who laid the foundations of the new Navy which was not found wanting in 1939.

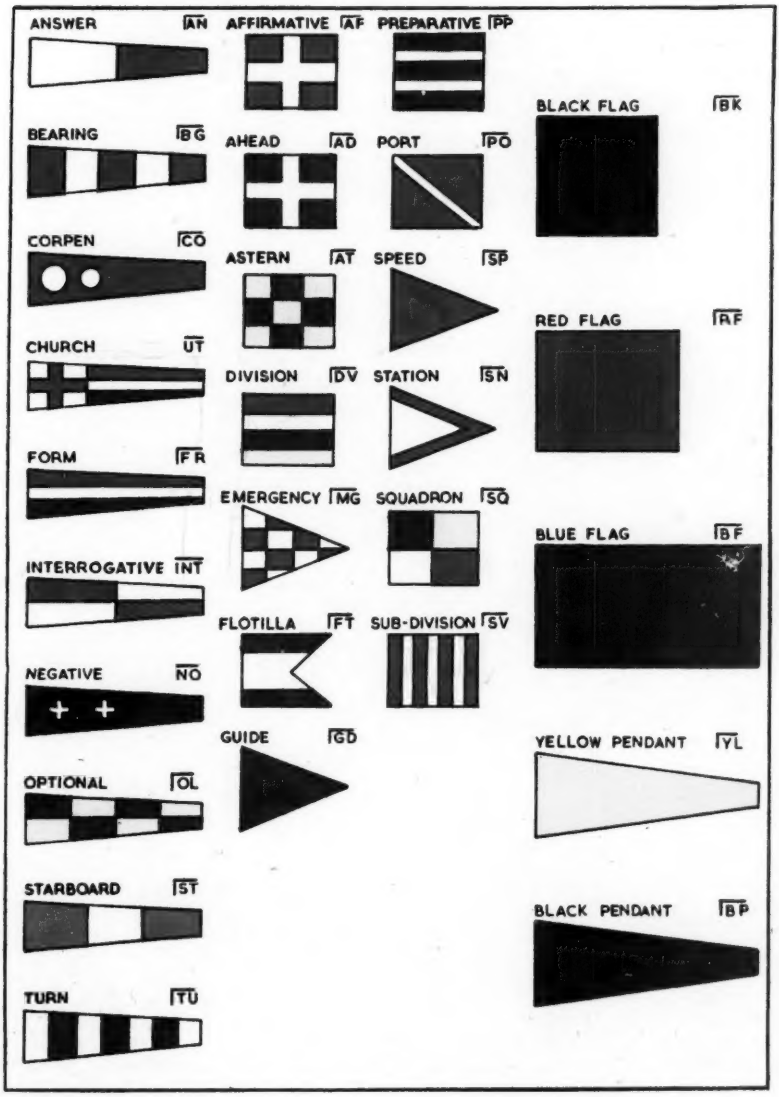
"Together Jellicoe and Beatty led the Royal Navy through the last crisis of the long centuries when sea power depended upon ships and seamen alone. Their names bridge the gulf between the classic tradition of Trafalgar and the onset of total war as we know it to-day. They were buried in St. Paul's Cathedral twelve years ago ; but it is right that we should do them this final honour here in Trafalgar Square, beside the monument of our greatest seaman and on the anniversary of his greatest victory."

[1]Winston Churchill—*The World Crisis*, vol. III, p. 112.

ALPHABETICAL FLAGS, NUMBERED PENDANTS AND NUMERAL FLAGS.



SPECIAL FLAGS AND PENDANTS WITH THEIR MORSE PROSIGNS.



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[Authors alone are responsible for the contents of their respective Papers. All communications, except those for perusal by the Editor only, should be addressed to the Secretary, Royal United Service Institution.]

THE NEW NAVAL SIGNAL CODE

BEFORE the end of 1948, drastic changes in the signal flags used in the Royal Navy will have taken effect. There have been a number of such changes in the past, but at no time has there been such a wholesale scrapping or alteration of flags and titles, resulting in only twelve out of eighty-six remaining as they were in 1939.

The necessity for such revision is not far to seek. It is several years since there was a marked change in the designs and colours of naval flags, but as a result of the late war and many new inventions the very basis of flag-signalling has been altered out of all knowledge. In 1916 the Grand Fleet comprised twenty-four battleships and it was customary to manœuvre it by equal-speed, forming-and-disposing or deployment signals. In the present day it is not likely that even half-a-dozen capital ships will be manœuvred in a formal battle line, and the tendency is to require a more flexible set of signals. It is said that this follows the practice in the United States Navy in the war in the Pacific.

There were also technical reasons why revision of the flag designs had become desirable. The number of signal flags had steadily increased until, in 1939, there were no fewer than eighty-six ; so that any reduction, however small, would be an advantage. Three flags contained the objectionable green tincture. Furthermore, H.M. Ships had to be equipped with two distinct sets of alphabetical flags—naval and International Code, and sometimes with three sets of numeral flags—R.N., International, and U.S.N. codes. In some cases the same coloured flag had a different signification according to which code was being used ; for example, the A, B and C flags in one code were Y, W and Z respectively in the other ; 1, 3, 4, 7 and 0 pendants in the one were 3, 8, 6, 9 and 5 in the other. In all the five series mentioned only one flag was common to two.

During the 1914-18 War, the United States sent five battleships to reinforce the Grand Fleet. These formed the Sixth Battle Squadron. All the British orders and methods were adopted to enable this unit to fit completely into the organization, and one of the first tasks of the Americans was to master the R.N. methods of signalling. Lieutenant-Commander E. W. Money, R.N. was sent as the signal liaison

Acknowledgments are made to the *London Bulletin* of the R.N.V.S.R. for the loan of the blocks used for the frontispiece to which this article refers.—EDITOR.

officer to the flagship "New York," and a British Chief Yeoman of Signals was sent to each of the United States battleships. After that war the U.S. Navy permanently adopted certain of our flags, including our Numeral, Equal-Speed, and No. 2 pendants under the names of Deployment, Turn, and Formation respectively. Now that process is being reversed, and we are adopting American flags for our use.

In considering how to reduce the five series to two or three, the compilers had to take into account the existing forty symbols of the International Code and the fact that the American Navy already used the International alphabet. The obvious thing to do, therefore, was to scrap the naval alphabetical flags and adopt the International set. For naval purposes, however, it was still necessary to have ten numeral flags. The old naval set could not be retained because no fewer than five of the flags were already in the International alphabet as letters (K, P, T, U and X). As a new set of numeral flags had to be brought in, again the obvious thing to do was to adopt the U.S. Navy's version and so facilitate communications in future combined operations. At the same time various other United States designs were adopted and other British designs dropped, including the ten numbered pendants.

Twelve flags of the original naval alphabetical set have disappeared, the highest mortality being among the triangular pieces, once so popular in the British naval codes. Of these, J, M, N, Q, R, T and X have been abolished, after some very lengthy services. M and N, for example, denoted the Starboard and Larboard Divisions as long ago as 1816. The familiar X, established in 1889, was used to denote "astern," its five black and yellow bars being said to resemble a wasp's stern. The rectangulars to disappear are D, G, I, K and S. Of the former numeral flag series, five (1, 2, 6, 8, 0) remain as members of the International alphabet, while No. 3 reappears as Astern in the new set. The other four are abolished. So end some links with the flags of Howe and the Trafalgar era (Nos. 4, 7 and 9), and No. 5 (the red-over-white), said to have been one of the oldest designs in the Service.

The pendants to disappear are No. 5 (no loss since its former good appearance was spoilt by increasing its red stripes from three to four), No. 6 with its two black crosses, No. 8 the plain red, and the Red pendant (formerly Compass).

There seems to have been a good deal of compromise in the matter of the Special pendants and flags. In some cases both the designs and titles of the English series have been left; these are Answer, Bearing, Church, Affirmative, Interrogative, Preparative and Port; also the Black, Red and Blue flags and Black pendant. In other cases, although the design has been kept, the nomenclature has been changed; for example the old Numeral pendant (with its conspicuous chequers of blue and yellow) becomes the Optional. The comparatively new Course pendant (of 1936) now becomes Negative, perhaps through the association of crosses and black and white in contrast; and the very old Negative becomes zero. The former pendant No. 9 is now Starboard—the sole surviving example of the green tincture fetish. Order—the handsome white-and-blue Equal-Speed pendant of Jutland fame, now changes again to Turn; while the former Blue Affirmative alters to Ahead.

In effect, the new Naval Signal Code consists of the flags and numeral pendants of the International Code; ten numeral flags, with one exception identical with those used by the U.S. Navy; and twenty-eight "extras," making seventy-eight in all.

The following is a summary of the flags :—

Alphabetical Flags.—The twenty-six lettered flags of the International Code of 1931.

Substitutes.—First, Second and Third, those of the International Code of 1931. Fourth, red triangular with yellow square at the hoist[1].

Numbered Pendants.—The ten numerals of the International Code of 1931.

Numeral Flags, all rectangular, as follows :—

ONE, red with central horizontal yellow stripe.
TWO, yellow with central horizontal red stripe.
THREE, blue red blue horizontally.
FOUR, red with white saltire.
FIVE, yellow with blue saltire (former OPTIONAL).
SIX, white with three blue diagonal stripes (045°).
SEVEN, red with central vertical white stripe.
EIGHT, yellow with central vertical blue stripe.
NINE, blue white blue vertically.
ZERO, white with five black crosses (former NEGATIVE).

Special Flags.

AFFIRMATIVE, existing.
AHEAD, former BLUE AFFIRMATIVE.
ASTERN, former 3.
DIVISION, red white blue yellow in four equal horizontal stripes.[1]
EMERGENCY, triangular, twelve chequers of white and red.[1]
FLOTILLA, swallow-tail, white with blue edges top and bottom.[1]
GUIDE, triangular, blue.[1]
PREPARATIVE, existing.
PORT, existing.
SPEED, former P.
STATION, former Y.
SQUADRON, rectangular, quarterly blue yellow white red[1].
SUBDIVISION, seven equal vertical stripes of red and white[1].
BLACK FLAG, RED FLAG and BLUE FLAG, existing.

Special Pendants.

ANSWER, existing.
BEARING, existing (International Code ANSWER).
CORPEN, red with two unequal white discs.[1]
CHURCH, existing.
FORM, former No. 2 PENDANT.
INTERROGATIVE, existing.
NEGATIVE, former COURSE PENDANT.
OPTIONAL, former NUMERAL PENDANT.
STARBOARD, former No. 9 PENDANT.
TURN, former ORDER PENDANT.
YELLOW, large size, plain yellow (origin unknown).
BLACK, existing.

[1] United States Navy flag.

On balance, these British modifications seem to outweigh the number of complete concessions to America in the Special designs, which amount to seven.

Pendants denoting numbers are still designated "Numbered" pendants, probably to distinguish them from the "Numeral" pendant. This is the same as the Church pendant which, when hoisted superior to numeral flags, is referred to as the "Numeral" pendant.

In the British Fleet a Numeral pendant has been in existence for at least 150 years. Previous to the recent change it had eight chequers of blue and yellow, and its principal duty, although in course of time it had many other, was to give to a numeral flag a numerical value. Numeral flags used singly often had an important primary meaning, such as the "8" (yellow and blue halved vertically) which meant "Anchor," and was employed for this purpose at the Battle of the Nile, and the "5" flag of recent times, which denoted "Open fire and engage the enemy." But, if it were required to express eight units, or five of anything, the Numeral pendant was brought into play.

The new numerals are planned to a definite pattern. Omitting Zero (which in the American set contained five blue globules instead of five black crosses), it will be seen that there are three series of red-yellow-blue, the first three flags in horizontal combinations, the next three in diagonal mixtures, and the last in vertical designs; in each trio the first flag is mostly red, the second yellow, and the third blue.

Some of the flags in the new Code are throw-backs. The Squadron Flag (quarterly blue, yellow, white and red), besides having an American origin, was a French signal flag more than a century ago, and was known as the *quatre couleurs*. The Guide Flag was in the British Naval Code in 1782 to distinguish the Rear Squadron (The Blue) and was only abolished in 1882; and the new No. 9 was in the old Howe code and at the Battle of Trafalgar as No. 7, only disappearing from the British signal book in 1889.

The national colours, as exemplified in the Union Flag and the British Pilot Jack, have been very rightly abolished for signal purposes; a reform long overdue.

On the debit side of the changes is the bad blue-red-blue colouring of the new No. 3 flag. The last thoroughly unsuitable flag to be invented was the E of the 1931 International Code. But for these two blemishes and the 1900 International Z, the flags of the new Naval Code may be said to be a satisfactory and even a handsome set.

THE DEFENCE OF DEMOCRACY

By COMMANDER STEPHEN KING-HALL, R.N.

On Wednesday, 13th October, 1948

MAJOR E. BEDDINGTON BEHRENS, M.C., in the Chair

THE CHAIRMAN: I have very much pleasure in introducing Commander King-Hall, who is going to give a talk on the subject of the Defence of Democracy, which will include various ideas of how military operations can be assisted by political and other subversive forms of warfare.

Commander King-Hall is one of those naval officers who retired from the Service young enough to know its problems, and yet have an opportunity to play a great part in other activities of his country. I am sure the views he will put forward will interest you very much indeed. We are all aware of the importance of these problems to-day.

LECTURE

THE last time I spoke in this hall was in 1920, and the subject on that occasion was "The Submarine and Future Naval Warfare." It was based on my Gold Medal Essay of the previous year, and it concluded with these words: "Over the desk of every Staff Officer in the Admiralty should be hung a notice with the words: 'April 1917, more than seven hundred thousand tons of shipping sunk by enemy submarines . . . Lest we forget'." Perhaps I ought to have added that the notice should also be hung in the Cabinet Room and the Board Room at the Admiralty. So far as I know, it was never hung up anywhere. The paper which I read on that occasion stressed the need for a large number of small escort vessels and small aircraft carriers as basic and permanent additions to the Fleet. It disappeared into the bound volumes of the JOURNAL, and that was the end of that.

To-day, the Council having honoured me by asking me to speak about the defence of democracy, I propose to reverse the tactics which I adopted twenty-eight years ago, and instead of keeping my really important notice until the end, I am going to give it to you now. One of the few things I have learned many times during those twenty-eight years is the extreme difficulty of getting anyone in authority to pay any attention to an abstract conception, such as an idea—just a simple unadulterated thought. This is rather curious, because just as the lightning precedes the thunder, so an idea is the predecessor and origin of all action. You may care to note that uneducated and child-minded persons are irrationally more frightened of thunder than of lightning, which is the real danger.

I think the explanation of the allergic attitude of those in authority to the pure idea is not hard to find. It is due to the fact that in the World of to-day nearly everyone with executive responsibility suffers very badly from a fearful disease which I call, rather vulgarly, the "constipation of current business." The symptoms are IN and OUT baskets full of papers, and the inability to think ahead because of the urgent necessity of thinking about what ought to have been done yesterday. That is the position of many people of executive responsibility.

Now I come to another notice which I would like to see hung up. I would like to see put in the Cabinet Room and in all the Defence Departments a notice reading as follows:

"What is the object of war?
To change the enemy's mind."

If anybody does not understand that proposition, I would say to MI.5, " Concentrate your purging in that direction, for such men are public dangers."

The fact that the object of war is to change the enemy's mind is the basic truth which I am putting up to you to-day, upon which all thought on the subject of defence must be based. If you leave that lifeline you will very soon get into trouble. That is the proposition I must first try to prove to you, and then I must show you how it should be applied in present-day conditions.

Before I come to the practical problems of defence, I want briefly to consider from a theoretical point of view, three questions :—

What are we trying to defend ?
Against whom are we trying to defend it ?
How should we defend it, against what ?

Before we can approach these problems, we must be clear in our minds as to why there is a problem of defence.

Defence means the whole complex of operations, policies, and devices required in order to obtain security. It is necessary to do something about security because strife and conflict seems to be an inherent factor in animal relationships. I have not got time to-day to make an analysis which is rather interesting (I am not qualified to do it, you would want an anthropologist on the job) as to certain differences between conflict between animals and between men ; but I would just put in as a footnote that in the case of human strife we find that weapons have been artificially invented and, much more important, we find that in human strife the conflict proceeds on the psychological plane. Human strife is essentially a struggle between ideas, which is another way of paraphrasing Aristotle's remark, that man is a political animal.

I am not concerned to-day with the security of the individual which is to be found in a defence system of law. It is, however, worth noting in passing that in Great Britain the individual's security is practically entirely based on ideas and not on his physical strength, on certain ideas that are accepted by all of us, which give us individual security. What we are concerned with to-day is the defence of certain sovereign States in general, and that of Great Britain in particular.

Now I would like to say a little about the word " war." If you look up the word ' war ' you will find it is derived from an old word ' werre,' which means strife or conflict. Unfortunately the word gradually became confined to that part of the business of strife which we now call military operations. As national States became more complex organizations, so strife between them (and its corollary, defence) became more intricate, and when this strife reached its extreme and most hostile form, the word ' war ' no longer described the whole business, which included economic activities, propaganda or political war, sabotage, total mobilization at home, rationing, direction of labour, suppression of Habeas Corpus, in addition to ordinary military operations against the armed forces of the enemy and extraordinary military operations against the civil enemy population. The word ' war ' no longer meaning what it was supposed to mean, but in fact meaning very much what it had originally meant, people tried to escape from the dilemma by inventing a new phrase, " total war." This is just about as absurd as that prize bromide, " unconditional surrender."

I strongly advise those who are sympathetic to me in this to forget all about the word ' war ' and think only in terms of security. Security is what you get if your defence resolves the conflict.

What is the object of defence? The object of defence, when your security is menaced, is to make the enemy agree with your views. It cannot be denied that perfect security will be obtained when there is universal harmony of views, because then there can be no conflict. Reasonably good security is obtained when the views of all sovereign States sufficiently powerful to menace your security are in harmony with the views and policies of your own State.

Whatever may have been the case before the 1914–1918 War, since 1919 it has been the policy of His Majesty's Government to obtain security by means of an extension into the international field of those democratic ideas and ideals which we have long practised in the domestic affairs of this Country in order to give the citizen individual security.

If time permitted, I could convince you that the great turning point in British foreign policy occurred immediately after the Boer War. To-day I will only ask you to remember that in that war the purpose of our military operations was to take away the independence of two small States. Within six years of the military victory, we gave back that independence in a larger framework, and backed it with the guarantee of the Commonwealth. That, in my opinion, is total victory, and I wrote a book with that title, showing that total victory is achieved when both sides agree that the peace settlement is correct and just, and a majority in both nations will fight to preserve the settlement. We saw that actually happening in South Africa, when dissident minorities were later suppressed by the South Africans themselves who did not wish to upset the peace settlement.

What we are trying to defend to-day is a philosophy of life: we call it the free way of life. When the bowmen of England died round Harold at Senlac, they were defending the feudal rights of Anglo-Saxon chiefs against Norman barons. When nine hundred years later the young men of the Empire were battling against the Luftwaffe in the skies above those same Sussex fields, they were defending a way of life, not an aspect of the economic system.

Why do I feel safe to-day and to-night against attack by atom bombs projected from the U.S.A.? With all respect to the R.A.F. officers present, it is not the R.A.F. that make me feel safe, nor even that we have excavators to make holes in the ground. What gives me a feeling of security is the thoughts and ideas which I believe are in American minds. I do not believe that public opinion in the U.S.A. would allow a bomb to be dropped on London, even if we have some pretty tough disputes with them in the course of the next three or four years. Do I feel as sure about public opinion in certain other countries? I do not. It is not that I believe that Russians or Yugoslavs or Poles are worse than any other human beings, but I am convinced that in the totalitarian State the public is misinformed of the facts and exercises insufficient influence on the actions of the Government.

This has been a very brief theoretical outline of the position, but I hope I have said enough to indicate what I call the intellectual character of the approach which has to be made. We must get out of the habit of thinking of war and peace as being in separate compartments. These are only aspects of international relationships which merge into each other and sometimes deteriorate into military operations. The object of military operations is that of a means to an end: the creation of conditions calculated to make it easier to achieve our supreme purpose, which is to change the enemy's mind. If you have captured that, his action will be reflected accordingly, and you will get security. Victory—total victory—is achieved when

we have captured the enemy's inner citadel, which is his mind. There are two ways of assaulting the enemy's mind: (*a*) the indirect way—the battle of the bodies; and (*b*) the direct way—the battle of the brains. To blend these two successfully is the strategy of defence. I am inclined to think that in a hundred years time some pretty hard things will be said about our strategy in the 1939–1945 War, because we allowed military operations to govern the whole strategy. We may even have lost the War on September 3rd, 1939. I am quite open-minded about that. We shall certainly have lost the War, or come very near to losing it, if all Western Europe goes into dictatorship.

I would like to put the practical propositions to you in the form of three questions. It may be that, for reasons of public security, we cannot discuss as freely as we would like whether the answers are right or wrong. The questions are these:

(*a*) Can the British Commonwealth of Nations be an effective force without Great Britain?

I do not think we can be: no doubt we should do something, but I think in fact in any conflict the Commonwealth without Great Britain would be somewhat in the relation of the Allied States, such as the Free Poles, and so forth, in the last war—auxiliaries, but not large-scale Allies.

(*b*) Can the United Kingdom be an effective military force in modern war without London?

Again it is my own opinion that the answer to that is "No." There are too many eggs in that basket.

Finally—and we cannot discuss this very publicly—

(*c*) Is there an effective and practical physical defence for London against long-range atom bombs?

Well, everyone has his own opinion on that. I can say I do not think there is. If I am right, what does that mean? Does it mean that the attack has at last finally and irrevocably overcome defence? Is the famous old principle, that to every attack there is a defence, no longer valid? In discussing this privately with serving officers, they have said to me, "Surely you know that principle: you are not telling us that there is not an answer to the attack?" I quite agree, the principle is as sound as ever, but what the principle did not say, and never has said, is that defence and attack must be in the same dimension.

When the first man was struck by a missile, his enemy had introduced space into conflict. This must have been a very novel conception, the blow delivered across distance: it must have seemed very queer to the first man who had a boulder dropped on him. Then the defence countered this with armour and camouflage, and so forth. To-day my theory is that the attack has reached the limit of physical extremes, that in fact, theoretically, from a physicist's point of view, we are getting in sight of the time when you might be able to disintegrate the whole World. The defence must move on the next step, and operate in the abstract by using the power of ideas, for our actions are what our thoughts make them, which brings me back to the question of the object being to change the enemy's mind.

It is almost common form on this sort of occasion to quote Napoleon, so I have found something he said which fits my argument: "There are two powers in the World—the sword and the mind. In the long run, the sword is always beaten by the mind."

Now I come to the question of Russia. There is the political enemy during the next twenty years. We are not planning to defend the Commonwealth against the U.S.A. or Franco Spain or a future Germany. Although I am keeping this on a strictly theoretical basis, I do not say a day may not come when some other great body of people may be a menace, but for the moment the obvious and practical menace comes from the East. I personally do not believe that Russia is in a particularly strong military or economic position. I only have, as ground for the opinion, a rather interesting visit I made in 1945, when for about six or seven weeks there is no doubt all the barriers were removed. I must say quite publicly that when the Parliamentary Delegation went to Russia in 1945 it was denied nothing. Anything and everything we asked for was shown. When I tell you I had the privilege of walking round their Imperial Defence College (I think that was an error, because when I asked to go back a second time, it was not permitted) you will realize the freedom we were given. From what I saw—we must take a balanced view—I guess they are not absurdly weak, but at the same time I do not think they are amazingly strong. I think we must assume that they will get stronger, and furthermore that, even if Russia is in a weak position, for internal economic reasons, the men of the Politbureau may find it expedient to have a forcible external policy.

There are two reasons why I deprecate the notion of imagining that we can defend ourselves against a strong and hostile Russia exclusively by military methods. One is, we are not strong enough. Secondly, perhaps more important, if we get ourselves involved in a third World War, I believe the cure will be almost as bad as the disease, because after the World has dosed itself with atom bombs it seems to me to be quite impossible to expect that you will be left with economic and social conditions in the least favourable to the free way of life, which is the thing we are trying to defend and maintain. If once the bombs go off, we have lost the war automatically, because even if we achieve military victory, we shall lose democracy. We have got to a stage when Plato's remark that "Many a victory has been and will be suicidal to the victors" takes on a very topical meaning.

Since we are trying to defend our way of life (and this of course involves the defence of the areas in which we live that way of life) against a totalitarian State which does not believe in our way of life, but rightly regards it (as did Hitler) as its most dangerous enemy, we must recognize at once that the war, or conflict, as I prefer to call it, *is on now*. In my opinion, we should regard ourselves at this moment as being citizens of a State at war with Russia, or in conflict with Russia, and in order to achieve victory and security we must change Russian policy. That must be our object. What, then, should be, first, our strategy and then, our tactics?

May I give you this reflection: in the First World War as a young naval officer I had an opportunity of seeing the battlefields of France. In those days the idea was to make a bombardment in depth, and a break through, so as to get on to the lines of communication of the enemy armies, and then, having destroyed them, the civilian population would be at our mercy. In no case, even after the most colossal efforts—and my Chairman, who was in the Gunners, may tell me if I am wrong or right in this—was it possible to make a bombardment in depth of more than five or six miles, even with field guns wheel to wheel.

Now take the 1939–1945 War. What did Hitler do? What did he say in *Mein Kampf* that he would do? He said, and did, what Lenin had advised. He carried out a psychological bombardment in depth right into the heart and head of the

French administration. He spent three years doing that before a shot was fired. He rotted the will to resist of the French. I happened to see this going on. I knew Reynaud and Mandel quite well; I even knew a famous lady friend in French political circles—I reckon she was worth about six divisions to Hitler.

Hitler said," How to achieve the moral breakdown of the enemy before the war has started: that is the problem which interests me."

Lenin, from whom no doubt Hitler got his ideas to some extent, said, " The soundest strategy in war is to postpone operations until the moral disintegration of the enemy renders the delivery of the mortal blow both possible and easy."

I do not know whether in military circles to-day it is taught that there was a Blitzkrieg and invasion of France in 1941, by an armoured force. If that is taught, it is wrong. It was nothing of the sort. It was nothing more nor less than a mopping up expedition to exploit the victory gained before the first shot was fired.

Remember that example now that we come back to Russia, and the practical problem before us to-day. Our strategy in this conflict with Russia must be to democratize the Russian people. I mean by this that we must have as our objective the creation in Russia of a public opinion which will be both willing and capable of preventing any Russian Government from behaving in an aggressive manner in international politics, just as our public opinion, rightly or wrongly (I happen to think rightly) will prevent the British Government from doing it.

The older members of this audience who remember thirty or forty years back will agree it would have been incomprehensible to our fathers and grandfathers to have had a situation going on such as that between Albania and ourselves to-day, with the scandalous case of the murder of British naval officers and ratings. I am not arguing the merits of this: there is a hard-boiled case where we are obviously right. Yet public opinion in this country, not confined to any one political party, would not allow the British Government to stand up for its rights in the old way; everything has to go through every possible way of finding a method of discussion. Nobody I think will deny that if to-day there was in Russia a public opinion which exerted on the Russian Government the kind of influence which public opinion exerts on the Government of this country, we should be in a very much more secure position than we are.

No doubt some of you may be saying," Yes, it is a nice idea, but how does one do it? " If anyone is thinking that, I ask you most earnestly not to start confusing strategy with tactics. Secondly, I say, I admit my strategy of trying to democratize the Russian people—is difficult, but not more difficult than various other alternatives, such as possibly having one day to invade Russia with two hundred mechanized divisions (that do not exist and which are not even born or likely to be born on our side of the fence).

In the last war it was decided that the correct strategy was to defeat the German army in France. I happen to have my doubts as to whether that was the correct strategy, though it was not so silly as calling the Italian peninsula the soft underbelly of Europe. Having decided on that strategy, the question was how to get to grips with the German army. I had the honour of being at two Staff Colleges, and I believe that if anyone had got up and said in those far-off days, " the proposition is to take a million and a quarter men across sixty or seventy miles of sea and put them out on a fairly well-defended coast, over which you certainly could not guarantee

you had any particular air superiority," you would have been told you had mistaken your vocation and had better leave the Staff College.

The answer, of course, was the Mulberry harbour. People did not say it was tactically impossible ; they said it must be done, and it was done. I had the pleasure of hearing from the lips of Marshal Stalin himself the observation that in his opinion it was the most brilliant, significant and remarkable military operation in the whole history of war, and how greatly the Russians were indebted to all that. At that very moment the Russian newspapers were criticizing that we had not started to fight, and why were we not doing something about it, which shows the gulf between what the Russian public is told and what the Marshal knows to be true.

If you agree with me that it would be desirable to have a peaceful, democratic, powerful public opinion in Russia, with a free Press and free speech, in other words a democracy, and that it would be desirable because this would give us security, the question of how to bring it about is a matter of tactics.

I would now like, very briefly, to summarize the argument so far. It may be useful if I put it in heading form.

There is inherent conflict in human relationships. This conflict is fundamentally and always must be a clash of ideas ; that is what makes human beings act. Within limits, it is a very useful conflict ; it is, in fact, democracy, until the conflict of ideas takes shape on certain basic things, when it gets dangerous : when the conflict becomes a dispute about the right to have ideas about ideas, then democracy is in peril.

2. The purpose of defence is to have security for our own ideas and way of life. That security is menaced when ideas which by their nature—such as Communism or Fascism—are held by persons able to dispose of great physical resources. We can only be secure when we have destroyed those hostile ideas by replacing them with our own.

3. At this particular time in our history, the enemy idea is Communism, physically centred in Russia. Therefore the defence problem, the search for security, can only be resolved by democratizing Russia, and that must be the object of our strategy. How it is to be done is the problem of tactics. I again repeat the warning, one must not confuse strategy with tactics.

Unfortunately, the nature of the strategy required in this particular problem was not recognized in time. I am bound to say I do not think it is adequately recognized yet. When I first ventured to put forward some of the theories I have given you to-day, in 1936 and 1937, and I tried, with the assistance of some friends, to apply them singlehanded in 1939 in an attack we made with News-Letters on public opinion in Germany, the object of the strategy then in those days was to separate the Nazi Party and the German people and to encourage any breach that might exist. By 1944–45 the object of the strategy was different : it should have been to get at the Russian people.

We probably had very great opportunities in 1941 of beginning to do something about getting at the Russian people, and the possibility that we might do this was thoroughly well recognized by the rulers of Russia who, as most people know, during the War were extremely careful to limit contacts to the absolute minimum required

on what we might call a hard balance sheet basis. They had to tell us something, but there was no encouragement given to what you might call any extra contacts on our part.

We have lost a number of years since those years, which I compare with the years we let the Nazi Party get a grip on the German people. In those three years we have lost not only any chance of getting directly at the Russian people and public opinion; we have been driven out of Eastern Europe, we are menaced in the Middle East and the Far East and, mark this, nobody can be certain that France and Italy are secure. I was happy to note that within the last nine months there have been signs of Italy being not so dangerously menaced as we thought, but few people would be prepared to bank on what might happen in France in the near future. I myself am slightly optimistic about the long-term view of France. It is not fantastic to suppose that we have got ourselves into a position at which we might find ourselves standing alone again—the only real centre in Western Europe, the Scandinavian countries having been overrun, where we could say the free way of life was adequately established.

In considering our tactics, we must bear in mind that the strategy which these tactics are to apply must be carried out within a different political and economic framework to-day, and a more unfavourable one than would have been the case in 1941, in 1945, or in 1947. It will be more unfavourable still in 1949 and 1950, unless we get going at once.

Broadly speaking, not only have we not, during the past three years, recognized the nature of the strategy we require: we have done worse. We have pursued a false strategy based on the absurd supposition that a compromise was or is possible between Communism and Democracy.

I am bound to say, and I yield to none in my admiration of Mr. Winston Churchill as a great war leader, that I thought it a very interesting remark of his in a speech the day before yesterday when he observed that *it had been his hope* that whatever ideology might be in control of Russia at the end of the War, Russia would be one of the three or four Great Powers which would guarantee peace. I must say, with the greatest respect, speaking in this room about this great war leader, that that does seem to me to be a blind spot, when someone can say, "irrespective of what ideology is in control of Russia."

It is shocking that we have been pursuing this false strategy, i.e. that a compromise was or is possible between two things mutually incompatible, because only in the last ten years, surely, we have had a first-class example that no compromise was possible between democracy and totalitarianism. That being the case, when we have lost so much time, our tactics to-day can no longer be designed to go straight to the heart of the matter. We cannot assume that everywhere between us and Russia, in this great area of millions of people, we are operating in a friendly atmosphere, and we must consider how do we go from here to get at Russian public opinion. A glacier has been put up between us and the Russian people: we have suffered an intellectual and moral Dunkirk. We are back on these islands with a doubtful foothold in Western Europe, and have to start from there.

I will come back to that in a moment.

Our object is to create democracy in Russia; that involves a double operation. We must first destroy the moral and physical hold the present régime maintains, and we must then build up a democracy. You have to make these things happen from

within. You will never teach democracy to people by wrapping it up in an atom bomb. You must disintegrate the Communist régime.

When you have decided on the nature of your tactics, you cannot work out a tactical plan without information or intelligence. When we decided that our tactics were to be to get at the German army, we collected the appropriate intelligence—by hundreds of thousands of photographs of the coast; by scientific men sent in to get the nature of the sea bottom, and so on. One collected the intelligence appropriate to the tactics. We have to consider what is the appropriate intelligence to-day.

Two years ago I made out a list of what the appropriate intelligence would be then. I thought of trying to do it to-day, but there are some things perhaps better not said in public.

Two years ago the list was :—

(*a*) What do we know about the Russian position we intend to capture ?

(*b*) What is Communism ? How many people go about talking of the need of fighting Communism who have never taken the trouble to study what it is. I only hope it is compulsory reading amongst some of those who are purging people. I would like to give them a four-hours examination on Communism.

(*c*) What is the Soviet Government machine ?

(*d*) What is the present state of Soviet public opinion ? There is a public opinion in Russia. What is it, does it vary ? Does it change ? What makes it change ?

(*e*) What is the present economic outlook ? Did anybody in authority foresee that remarkable devaluation which the Russian people were assured was the last sacrifice they would have to make ?

(*f*) What about the personalities ?

(*g*) What are the relations between Church and State ?

(*h*) What is going to happen if anything went wrong with Marshal Stalin's health ? It used to be a question of mine to Russian people, but it was not a subject they liked talking about.

(*i*) Is there a separatist movement in the Ukraine ?

(*j*) What is happening in the Far Eastern Republic ?

(*k*) What are the relations between the Central Asian republics and Moscow?

You could make out a list of a hundred things and not have come to the end of the information you require before you can base your sound tactical plan for psychological warfare.

Now, do we think we know the answers to those questions ?

We cannot all get up and say what we know, but I can tell you this story without indiscretion. In 1945 I sat round a table with the British Foreign Secretary, the Deputy Prime Minister and the British Ambassador to Russia, and the object of that occasion was to be informed about Russia. All the cards were put on the table. I assure you there was not very much put on the table. After it was all over, a very young British official from the Foreign Office who spoke Russian fluently and knew something about the Russian machine took me out to lunch, and said, "The Government knows hardly anything about Russia, and what it does know is wrong." I am

bound to say after my six weeks in Russia I was not the only one who thought there was a great deal in what he said.

A great deal has happened during the past two years. Our tactics to-day must take into account that we have been retreating for two years. Before we can get at the Russian people—the ultimate tactical aim to achieve our strategical purpose —we must overcome many intervening obstacles, and collect the intelligence needed to do this.

We must secure our own home front. I am not sure that the Civil Service purge is the best way to do this.

You have to make sure of your own base. We are up against a problem which transcends national frontiers.

On the home front we must not only be sure that we have got the enemy under control, but do something positive. We must build up faith in our own cause.

A very distinguished gentleman said to me not long ago, " I agree with every word you say, but have you made sure you know yourself what you are after in democracy ? "

There is the work of the Hansard Society, trying to build up the interest and attention of our people in the free way of life.

In France and Italy and Germany the strengthening of democracy is of the utmost importance ; you may have noticed in the Press the Government has asked the Hansard Society to do what it can to show the German political leaders the British way of life. Why this is such a novel problem is that it has hitherto never entered into our conception of our defence problem, that it is our duty to see that a free democratic Government exists in France. We see that a French Government has fallen, or has not, or we read something about Italy and think it is not our business. When I was in Rome talking to Saragat the leader of the Italian Socialists he could not understand why he did not have any support from the Socialists of this country. I explained that it was not traditional. The Italian genuine Socialists said, " Surely they recognize that we are their ally."

I remember during the War a distinguished Conservative M.P. said " These Italians cannot even fight, see how they surrender in such large numbers." I said " Surely you do not want them to kill British soldiers." " All the same," he said, " I cannot understand so many thousands of them surrendering without a shot fired." That is a traditional mood. I followed this up and said " Do you appreciate that to-day tactically your best ally in France is the Communist worker in the Renault works risking his life to sabotage war production ? " That was a bit too much for him !

The whole question of Germany to-day is obviously of great importance in our tactical scheme. Central and Eastern Europe must be penetrated : the Communist wave has swept West, and the democratic crusade must go East. You must not be on the defensive. I will not trot out the one about attack being the best method of defence, but it is fundamental. Instead of worrying about what the Russians are going to do next, we want the Politbureau to worry about what we are going to do next. I am not sure we have got them worried yet.

Whose business is it to be interested in all this ?

Where is the Chief of Staff of Political Warfare ? Perhaps he is there, but he keeps pretty quiet.

There is a clause under the Brussels Treaty which makes it possible to do something, and probably some little things are starting up in a small way.

Why has the Minister of Defence no responsibility in this matter? Am I a heretic here, or is it completely wrong that I should be talking about these things in the lecture room of the senior and most responsible institution in the country devoted to studying these matters? Ought we not to be talking about this kind of thing in this room? Ought we only to be talking about ships and guns and tanks and the three fighting Services? Does it not belong to defence, and why has not the Minister of Defence anything to do with it?

If you add up all the money to be spent on the kind of thing I am talking about, and I will include the British Council, I do not think it comes to more than £10 millions. The Minister of Defence has something to say about the £500/£600 millions for the rest of the Services, but not about the expenditure of some £10 millions. I think we are spending about one half of one per cent. on it. There is something wrong there. It shows a lack of appreciation of the importance of this subject.

One final question: suppose tomorrow there were a crisis (which God forbid) and we found ourselves in a shooting war. Does not everybody in this room know that a great Ministry of Information would immediately be set up. What would happen? The Government would commandeer the Savoy Hotel, and every journalist and public relations officer would be rushing down there to get £2,000 a year jobs on the enormous staff; there would be scandals in Parliament, and a change of Ministers every six weeks. If it is right to have a Ministry of Information when the shooting starts, why not before, and stop the shooting? I can never get a straight answer to that. I cannot see it is logical to set it up after the shooting has started, and not have something like it, but much more efficient, before the shooting starts.

The fact is I am going to put it to you in conclusion—that a complete revolution has taken place in the art of war. I should be less than honest if I did not say that I have very little hope that this fact will be recognized by more than a few people in any future that will interest us, but I would like to say that, from such contacts as I have been able to make, I think a high proportion of the people who do recognize it are to be found in the fighting Services. It is a great mistake to imagine, as some of the public do who are interested in this subject, that Admirals, Generals and Air Marshals are a poor lot of reactionaries. They know a great deal more about it than do the politicians. The politicians are the dangerous people. Too many of them imagine that the only way you can defend yourself is with a battleship or a tank or military weapons. The real danger lies in the House of Commons, not in the higher thought in the Services. They are like the medical practitioners who hear an unorthodox practitioner and are told this is quackery; then they have an uneasy feeling there is a great deal in it but it is more than their life is worth to give support to that. Therefore no one is thinking about it. This is perhaps exaggerated, because some people in the Services are doing a great deal of thinking.

Finally, the object of war is to change the enemy's mind. There are cheaper and more efficacious ways of changing the enemy's mind than that of destroying the material fabric of society so thoroughly that when you have won the military victory you find you have done so by creating social chaos in which it is impossible to practise that free way of life for whose security you thought you were going to war.

DISCUSSION

LIEUT.-GENERAL SIR GIFFARD MARTEL: I have a fairly wide experience of Russia, and I agree that Commander King-Hall has sized it up very well. It was an extraordinarily interesting lecture he gave us, from all viewpoints.

The only thing I thought perhaps I would like to hear more about was the actual practical things we could do straight away to try and level up the position as regards Russia. Why should we not encourage resistance movements in Germany, Austria, and Poland, straight away. That is what Russia has been doing with much success in our territories.

What is the immediate suggestion for making the enemy change his mind?

THE LECTURER: There are some practical things to be done. Because the situation has deteriorated between ourselves and the Russians so much, things that were possible even three or four months ago are probably impossible now; but even to-day there are a number of contacts between ourselves and the Russians, and the first thing to do is to put our own house in order; that is, to get acceptance of the theory. If you have got that accepted at the highest levels, and no doubt they can be influenced by people on lesser levels, it seems you would get this kind of thing. I have a suspicion that people who have to talk about Trade Agreements with the Russians or the Yugoslavs go into a room with their eyes in blinkers, and say "Our business is simply to exchange so many hundred thousand tons of coal, or wheat." That shows a deep misapprehension of the whole situation. Everybody who makes a contact with anybody from the other side, not only Russian, ought automatically to be a front line fighter in the battle of ideas.

Every time I have an opportunity, even in private conversation in England, of getting at the Communist idea, I do so and, going further afield, in France, Italy or Germany, I support people who believe in the free way of life.

Recently I met a crowd of friendly young British persons going over on a visit to Russia. I caught up with them two hours before they were leaving. They were rather Left and young Communists. I said, "Have you got all the facts? You are going to be told that nothing happened on the Clyde during the War and you never built a ship." One young man got worked up at that, and I said "Well then, how many, is what the Russians want to know. Have you got the British 'case' in statistical form?" They were not prepared in the least. They were being sent to visit Moscow, but were not even in the right clothes, they had not even been told that a pair of goloshes was the most important thing in a Russian winter. So they were rigged out by the Russians, and a girl was taken to the microphone and said how wonderful it was that the Russians had fitted them out, and the Russians told their people that the Capitalist countries were so badly off that they had sent their people out without even a pair of goloshes, and the Russians had had to clothe them, and so on.

I could multiply that example. It is nobody's business to look into all this and put it right.

MAJOR-GENERAL G. M. LINDSAY: I agree entirely with Commander King-Hall in what he says about the mental being more important than the physical. The mental means having the right *ideas*. The way to get the right ideas across, as he said, is by personal contact.

The Lecturer happens to be the fountain head of that wonderful organization, the Hansard Society, which is trying to put across our Parliamentary way of life to everybody it can, at home and abroad. He has mentioned to-day that we must get our own house, and Western Europe, in order. That is to say we must get Britain and Western Europe permeated with the right ideas before we can take the offensive properly on this mental line against the Cold War that is being waged against us by the Soviet.

We also in my organization—The Educational Interchange Council, are trying to get contacts, on a lower scale, from the civic councillor down to the workman, between Germany and Austria and this Country, in order to get the right ideas.

The Lecturer, having been to those countries, has said how immensely important it is now to influence the minds of the Germans and Austrians—the people just on this side of the Iron Curtain. If we can get those right ideas in Britain and Western Europe, do you mean to tell me we should not be able to infiltrate them through the Iron Curtain into Eastern Europe? Nothing on Earth will stop it, provided you have, as he said, instilled these ideas properly into the people who can do that infiltration. Of course you can, and there are people coming back through the Iron Curtain all the time who can be used for this purpose.

Remember that no war, whether of ideas or weapons can be won by passive resistance. We have got to take the offensive in our War of Ideas and, if we cannot win the War of Ideas, we shall inevitably be forced to fight the War of Weapons.

THE SECRETARY (CAPTAIN E. ALTHAM, R.N.): I want to refer to the query which the Lecturer raised as to whether this was a suitable forum for discussing matters outside the narrower interpretation of warfare and military studies.

I would like to assure him and anyone else who may be in doubt, that the Royal Charter which we were given so many years ago, to promote and advance the science and literature of the Services, is now interpreted very widely.

The Council long ago decided that the Institution should embrace all those studies which to-day relate to the professional education of officers in all three Services, and that it should not be regarded as being restricted to purely technical or professional matters.

You will, I hope, see that policy reflected in the JOURNAL. You will certainly find it reflected in the contents of the Library, which is being increasingly stocked with literature relating to those aspects of international affairs which, unfortunately, sometimes lead to war, or which, in any event, it is the business of officers in the present day to study and understand.

THE CHAIRMAN

Knowing many of the younger men in the Services to-day, I perfectly agree with the Lecturer that the ideas he has expressed on this subject are much more clearly understood by them than by some of our political chiefs.

If we look through the 1939 and 1940 records of the German Command, we see that when Poland was attacked, there were only about 10 German divisions on the Western Front. They were quite safe, because 110 French divisions were imbued with the idea that if they attacked they would suffer the terrible slaughter of the attacking armies—in the trench warfare of the previous war. So although with a superiority of ten to one in their favour, they never attacked Germany at this decisive moment.

Do we see the contrast to-day? Yes we do. A little country like Finland, which has suffered as much as any country after two major wars, puts up a heroic resistance against overwhelming odds. Finland is absolutely determined that, rather than give in to a communist régime, she will fight again, even to be completely destroyed. The Russians know this, and accept it; that is why, although the Finns are quite isolated from us to-day, and a very small country compared with the giant next door, the Russians do not try and press forward the claims they have made on their other satellite countries. That is a marvellous example of how the spirit of a free people really desiring to sacrifice everything for their existence, can prevail against a powerful enemy.

Therefore, if we can imbue that kind of spirit in all the Western countries, a source of enormous moral force would have been created and one which is at present very largely set aside in our calculations. What ought we to do?

It seems to me from this discussion that we should counter Russian activity by organizing real economic and psychological warfare; whether officially or unofficially, it does not matter. All that matters is that it should be done on a large scale, and that the ablest brains in the country should organize this development in conjunction with the Ministry of Defence and other departments.

I have a particular interest in mentioning this, because I may tell you I made, in 1939, a private visit to Bulgaria, to see if by economic ties and other arrangements it was possible to detach her from the Axis influence two months before the War started. This is a fact I have never mentioned in public before. We came to the conclusion that if we could get Bulgaria with us, the whole of the Balkans could be united on our side. Yugoslavia, Greece, Roumania, all could be neutralized by Bulgaria. All that was necessary at that time was to say to Bulgaria, "your total exports are £10 millions which all go to Germany. What are they? Largely tobacco and fruit. We will take this and prevent your complete economic dependance on Germany." For a small capital expenditure and a financial risk that could have been minimized by a really constructive marketing policy, we could have got Bulgaria on our side, and secured the overwhelming support of those elements in that country that were friendly to the whole idea of a Balkan Entente.

When the War started we would have been glad to spend £500 millions, compared to the £10 million required at that time to secure the same result. A small effort in canalizing Bulgarian exports would have made the whole difference to the existence of that little State, and the whole balance of the Balkans.

Why was that not done? Because at that time we were always afraid that if we helped our friends, our enemies would dislike us even more. I always remember Mr. Chamberlain saying to me at the time that the Germans regarded the Balkans as their natural commercial outlet, and we would only precipitate a war, by not conceding this.

What I feel so important to-day, is that we should actively help our friends.

You mentioned the Italian Socialists; you can multiply that example all over the World.

What do the Russians do? Through the diplomatic bag they send in unlimited money, and help to organize any activity that will be fighting against our ideas. The amount of money that we would require to counter this is infinitesimal compared with a few hours of war. Therefore I do feel strongly that this whole aspect should be considered as a constructive way of dealing with this. With every method—economic and political, we should start now to help all those elements—and they are very strong elements, sometimes co-ordinated and sometimes unaided—who are fighting against the Communist menace.

Why should it happen to-day that we neglect to succour thousands of Czecho-Slovaks who are coming over to escape this terrorism? We put them in concentration camps when they arrive in our zone. You have Members of Parliament, former Ambassadors, from these countries. They come here and are not wanted. We consider them practically as unemployable. What would the Russians do in those circumstances? They would help to organize them, they would try and make them feel they were amongst friends. These people have left their country or run away because they are fighting for our ideals. They are the spearhead of the people we require to go back to those countries afterwards to help to fight our battles.

I can only say I am sorry I have taken so much of your time, but I do want to stress on behalf of us all how grateful we are to Commander King-Hall for the constructive and imaginative way he has dealt with this important subject.

The customary votes of thanks to the Lecturer and Chairman were carried by acclamation.

SEA AND AIR POWER

By J. M. SPAIGHT, C.B., C.B.E.

A RECONSIDERATION of the meanings to be attached to and the interrelation of the terms sea and air power is overdue. It is needed to clear away the fog of uncertainty which surrounds the subject at present. The absence of an agreed understanding on the significance of each term is in great part the reason why the discussion of the relative importance of naval and air action in war is often conducted in a rather acrimonious way. The whole question could be debated in a more objective and less partisan spirit if the disputants knew exactly, not only where their opponents stood, but where they stood themselves. They are not sure of their ground at present; hence an occasional tendency to lose patience, to dismiss sea power as a back number and air power as nothing but baby killing. Neither is anything of the kind.

Air power, as the later-born, has inherited, naturally, some of the doctrinal wardrobe of sea power and—again naturally—the fit is not in all respects perfect. Lord Tedder pointed out in his second Lees Knowles lecture in 1947 that both air power and sea power meant different things to different people. To some, sea power meant naval forces, to others, the majority, it meant the ability to use sea communications and to deny them to the enemy. "My use of the phrase 'air power,'" he said, "is in a similar sense to the traditional definition of 'sea power'; that is to say, air power is the ability to use the air spaces for offensive, defensive and supply services, and to deny their use to an enemy." "It includes," he went on, "air forces, civil transport, air bases, communications for control and direction, radar and radio facilities, aircraft and engine industries."

With that definition one may compare another which has been suggested by the Commanding General of the American Army Air Forces in the recent war. General H. H. Arnold stated in his report dated 12th November, 1945, to the Secretary of War, Washington:—

"Air power includes a nation's ability to deliver cargo, people, destructive missiles and war-making potential through the air to a desired destination to accomplish a desired purpose. Air power is not composed alone of the war-making components of aviation. It is the total aviation activity—civilian and military, commercial and private, potential as well as existing."

The inspiration of both definitions is not far to seek. It is the doctrine of sea power which Admiral A. T. Mahan, the American naval historian, first enunciated nearly sixty years ago. Mahan made it clear for the first time that sea power meant something far more than the winning of naval battles, than the hoisting of brooms or whips at the masthead. For him it meant essentially the "noiseless, steady, exhausting" pressure to which control of the sea has the power to subject an enemy. It was a great unseen force which worked in the background, "quiet and unperceived" but remorseless and decisive in the end. And it meant more than blockade and naval action. It embraced all the elements which went to make a country strong on the sea—its merchant fleet, its shipbuilding industry, its seafaring population, geographical position, its maritime characteristics and its institutions. The high seas being free to all, Mahan was spared the necessity, as Mr. J. C. Cooper has pointed out in *The Right to Fly* (1947, page 42), of dealing with one problem which complicates matters in the air, the "political right to fly."

Mahan's teaching has influenced naval thought profoundly from his day to ours. Among his distinguished disciples was the late Admiral Sir Herbert Richmond, who expounded and developed it for our own times. Sea power, the latter held, is composed of three elements—fighting instruments for controlling the sea, bases for them, and vehicles of transport in which troops and trade can be carried. " These fighting instruments and these vehicles operate to-day on the surface of the sea, under the sea and above the surface ; they extend from the largest battleship to the submarine, the motor-boat and the aeroplane. All are instruments of sea power."[1] Others have gone further and have questioned the existence of an air power corresponding to and co-equal with sea and land power. What is the truth ? Is there no such thing as air power in the world which we know ? Is there nothing more than an additional weapon in the armoury of sea and land power ?

There can be little doubt about the reality of air power in the mind of anyone who witnessed certain happenings in eastern England in the years 1944–45. Was not that reality manifest in the great armadas which we used to see moving majestically across the morning or evening sky in those days, setting out for or returning from their raids into Germany ? Surely it is an abuse of words to say that we were here in face of anything but air power ? And if these bombers were instruments of air power, were not equally so those whose targets happened to be not on land but on sea ?

The German FW 200's which harried our merchant shipping on the high seas and our V.L.R. bombers which hunted U-boats in mid-Atlantic were instruments of sea power if the criterion is exercise of control of the sea. They were instruments of air power if Lord Tedder's definition applies, for they were using the air spaces for their warlike purposes and trying to deny them to the enemy. Which in fact were they ? And was the use of bombers (also land-based) for mining enemy waters the exercise of sea power or of air power ?

The truth is that the definitions do not correspond with the reality. They separate the sea and the air too precisely and therefore give a wrong impression. One would not gather from them that sea power goes up and uses the air space on occasion, or that air power goes down and meddles with shipping. Mahan wrote before the days of flight and he formulated his doctrine of sea power without reference to that disturbing complication. He formulated it for a world in which the great sea lanes were thronged with traffic and the skies were empty. It was around the safeguarding of that maritime traffic, so far as it was beneficial to the possessor of naval strength, the capture or stoppage of it so far as it was not, that he built his concept of sea power. The conditions in the air are different. In the air there is no corresponding traffic to be protected or intercepted ; but there is more traffic on the sea than ever, and aircraft can and do take a hand in interfering with that. A definition of air power which takes that of sea power as its model and simply substitutes the word " air " for the word " sea " wherever the latter word occurs, and adds nothing by way of qualification to the new formula, is not a satisfactory definition. It breaks down when the definition is brought into relation with the facts.

On the other hand, to start afresh and, discarding the old formula, to define sea power as the power exercised by water-borne vessels and air power as that exercised by air-borne is not really to simplify matters. It only leads to difficulties in the application of the definition. Strictly applied, it would mean that aircraft on a car-

[1] *Statesmen and Sea Power*, 1946, Introduction, p. x.

rier's deck would be regarded as instruments of sea power until they took off, for they, in common with all else in the ship, would until then be water-borne, and instruments of air power while in the air. If, to avoid such sudden changes of classification, the rule were adopted that the *type* of the aircraft, marine or land, and not its actual use at the moment, should be the criterion, difficulty would still arise. An aircraft of land type may be carrier-borne. Conversely, flying boats, though ordinarily water-borne, fly across continents with the utmost nonchalance and might well be used in circumstances in which it would be anomalous to regard them as instruments of sea power.

The commonsense course is to classify ship-borne aircraft as instruments of sea power in all circumstances. It is sea power that brings them into a theatre of operations. Their function is to extend the effective range of the ships' guns and torpedo tubes. So far as they are concerned, Admiral Richmond's conclusion seems to be unescapable. The battles of the Coral Sea and of Midway Island, fought in May and June, 1942, respectively, cannot be called anything other than naval engagements; yet the surface vessels of the belligerents never came within sight or range of one another. Coral Sea was a battle fought entirely between the warships of each side and the aircraft of the other, and all the aircraft were carrier-borne. So were some of the aircraft that were in action at Midway, but there land-based (American) aircraft were also engaged. The latter could be held to be instruments of air power, but the former could not reasonably be regarded as anything else than instruments of sea power; they were a means of extending the range of the warships' armament. That was true also of the aircraft of the Fleet Air Arm which were engaged in the actions at Taranto on 11th November, 1940, at Cape Matapan on 28th March, 1941, and in the pursuit of the "Bismarck" on 4–6th May, 1941. So, too, the Japanese naval aircraft which sank the American warships at Pearl Harbour and the "Prince of Wales" and "Repulse" off Malaya in December, 1941, could hardly be regarded as other than instruments of sea power.

It is advisable in any definition of air power which hinges on the use of the air space to make an exception, by reservation or otherwise, for naval aircraft, whether at rest or in the air and whether serving afloat or in shore establishments. The latter aircraft, manned by naval officers and ratings and serviced by naval *personnel*, can best be classified with ship-borne aircraft; they are *matériel* of the Navy and in that sense a component part of sea power. Another reservation which seems also to be necessary relates to the use of V-weapons and similar new missiles. They, too, can be said to use the air spaces for offensive purposes, yet they could not properly be regarded as instruments of air power; they are more akin to the long-range projectiles used by land or sea power.

How, then, are we to define sea and air power? The writer suggests in the first place that any definition which speaks of the *denial* of the use of the sea or the air, as the case may be, to an enemy is a misleading definition. Neither the one element nor the other can in fact be denied to an enemy. "The normal condition in war is for the command (of the sea) to be in dispute."[9] That is still truer in the air. What is in question is not the monopolizing of either element but the utilizing of it more freely than an enemy can and to better advantage. It is the enlistment, so to speak, of the element as an ally on one's own side.

[9] Sir Julian Corbett, *Some Principles of Maritime Strategy*, 1918, p. 188.

Sea power is, in fact, a nation's capacity for exploiting all the possibilities which action at sea affords of injuring an enemy militarily and economically and of benefiting itself. Air power is a corresponding ability to make use of the air. Neither the one term nor the other should imply exclusive possession of the element. It is advisable, too, in order to prevent misunderstanding, to add to a definition of air power which speaks of the use of the air a rider that this expression is to be read without prejudice to the view that the use of a naval air arm is the exercise of sea power, and the use of long-range missiles or projectiles the exercise of sea or land power as the case may be.

The kind of definition suggested in this paper, a reader may object, would still leave it open to argument whether sea or air power is in action in various circumstances which are readily conceivable, and that it may lead, therefore, to controversy. Why should that be so? It is all a question of team work and naval and air power are partners through force of circumstances. The limits of their respective domains need not be rigidly demarcated; indeed, they could be so demarcated only if for the purpose of a definition one assumed conditions to exist which do not in fact exist. A certain amount of fluidity in the formulæ reflects a similar fluidity in the subject-matter of them. For that reason it may be that anything in the nature of a formal definition is best avoided. *Omnis definitio periculosa est;* there would be a danger of a definition of sea or air power being cited in support of a claim that a given operation should be under naval or aerial command—a question the answer to which should not necessarily be dictated by the defining formula. Some, indeed, might say that it would be better, on the whole, to drop the terms sea power and air power altogether. They have probably come to stay, however, and would continue to be used even if officially discarded.

It may be that what is needed is not so much a doctrine as a working rule, not so much a definition of sea power and air power as an agreed understanding that the spheres of the two Services cannot be sharply demarcated in the way which a definition, or even the use of the terms, would imply. They are co-operators, not rivals. Neither can do without the other. The control of sea communications may involve a call upon Bomber, Fighter and Coastal Commands of the Royal Air Force no less than the surface, sub-surface and super-surface units of the Royal Navy. Conversely, the winning of the command of the air may demand the employment of naval as well as air forces; it was so in Malta, for instance, in the recent war, when fighters had to be flown in from carriers for the defence of the island. Anything in the nature of autarky for a fighting Service is an impossibility. Interdependence is inescapable. Strategically and tactically the arms of war have a common aim and share a common destiny, and the emphasis in any discussion of their functions would be laid more profitably upon that which unites them rather than that which divides.

The division of the Services into three is a matter of practical convenience, serving the useful purposes of facilitating administration and special training and fostering *esprit de corps*. The division implies in some measure that there are three distinct kinds of warfare to be waged—at sea, on land and in the air, but these categories overlap in practice. In any case they sum up to not three wars but one—a war which is won by the victor State imposing its will upon the vanquished. We have no assurance, even in this age of atomic weapons, that any one of the three Services can safely be dispensed with in the complicated process involved in the achieving of that end. There is really, in fact, only one " power "—war power, and that is exercised by the three arms in combination.

THE DEVELOPMENT OF COMBINED OPERATIONS MATERIAL AND TECHNIQUE

By COMMODORE J. A. GRINDLE, C.B.E., R.N.

On Wednesday, 20th October, 1948

MAJOR-GENERAL V. D. THOMAS, C.B.E., in the Chair

THE CHAIRMAN: Commodore Grindle has had experience in combined operation matters both as a planner in ROUND-UP, which you will remember eventually turned out to be Operation OVERLORD, then with the Americans on the Joint Planning Staff in Washington, and subsequently a little nearer the real scene, when he was directing landing craft of some sort, I believe, in Algiers. Then he moved farther East and was the N.O.I.C. in Operation ZIPPER. He is now Director of Combined Operations (Naval), and has responsibilities on the subject which he is going to talk to us about.

LECTURE

SINCE the end of the War a number of lectures have been given in this room and several articles written in the JOURNAL on the subject of Combined Operations. They have dealt with either the Staff side or, as a separate matter, the technical aspect of Landing Craft design. To-day I am going to try and relate the two, and to show how material is the servant of assault technique and how they grew up together. Sometimes, it is true, material lagged behind, and on occasion war plans had to be delayed. Such delays as did occur were not because a solution could not be found to the problem, but because the necessary quantities of material could not be produced.

Ships and craft and, indeed, all weapons of war, must be kept as simple as possible if we are to be able to produce them in sufficient quantities and use them lavishly without worrying too much about their replacement. Peace-time always tends to complicate design either by adding gadgets which are desirable and ingenious but not essential or, more particularly in the case of the Navy, in improving conditions for the men who have to live on board for long peace-time commissions. Not only do such additions and complications slow up initial production, but they increase the maintenance problem and invariably add to the weight of the ship, which in turn affects the beaching qualities of the ship adversely.

As a start, I would like to put forward one possibly new thought and give two definitions which may help to simplify matters. The new thought is that perhaps the phrase " Combined Operations " is out of date. To begin with, the very word " Combined " means an inter-Allied combination ; the word " Joint " is the proper adjective for the inter-Service work of one Ally. I am not at all sure that what we now call " Combined Operations " is not, in fact, Land/Sea Warfare, just as the other two legs of the tripod are Sea/Air Warfare and Land/Air Warfare. There can be no doubt that the material side of our work is almost entirely a matter for the soldier and the sailor. Assuming that we realize that neither is of any use at all without the air, you will perhaps forgive me if to-day I appear to disregard the Royal Air Force and Naval Aviation. In fact they both do the job they are basically trained for in all types of operation.

Planning, command and communications are, of course, a rather different matter, and are specially dealt with by the School of Combined Operations and the Combined Signal School, where officers and men of the three Services work together and concentrate on the problem of the assault landing and the subsequent build-up.

Combined Operations—or, as I prefer to call it, Land/Sea Warfare—has achieved a reputation of being a Black Art practised, at least so far as the Navy is concerned, by a crowd of undisciplined and usually bearded men who like to call themselves sailors and have the privileges of the sailor, but who dress themselves as untidy caricatures of soldiers. Much of this criticism is untrue, but the Black Art business must be discouraged. One of the tricks of the trade was to use a large number of strange short titles and initials. It is to clear away this mass of initials that I ask you, this afternoon, to remember just two definitions—those of "ship" and "craft." The "ship" is designed to be capable of making long ocean passages, and is largely self-supporting administratively; the "craft" is specially designed for inshore or, in a few cases, cross-Channel work, but for anything more than a short sea passage it has to be carried in a parent ship and in any case requires a shore-based or ship-based administrative and maintenance organization. Both ships and craft may, in some designs, be capable of beaching, and they then become landing ships or landing craft.

Land/Sea Warfare has been practised by nearly every nation in the World, starting, perhaps, with the Greeks in 415 B.C. There is, of course, an immense amount of extremely interesting literature to be read on the subject. I do not intend to go over that ground, but merely to point out that we can find in history the forerunners of nearly every single kind of special ship and craft such as we used in the last war. Primitive some of them were, but they all had one object, and that was to bridge the gap between the soldier somewhat out of his depth as a passenger in a convoy, and the soldier ashore, properly organized, fighting with his own weapons on the dry land which he understands.[1]

In this matter of bridging the gap, the sailor is the servant or, perhaps, the agent of the soldier. I prefer the word "agent" because I understand that agents can argue with their principals, whereas servants have to do what they are told. Not unnaturally the soldier wants to fight with bigger and better equipment than his opponent, and it is the Navy's duty, or perhaps privilege, to try and help him to attain this very understandable and human ambition.

The Pre-War Situation

As we all know, little practical work was done between the wars, but a small inter-Service team had been working on both technique and material under the Deputy Chiefs of Staff from about 1937. They were broken up when the Abyssinian crisis led to partial mobilization, but were reassembled a few months later. In March, 1939, they reported to the Chiefs of Staff that, whereas it might be possible to mount minor raids from Malta at two or three days' notice since small craft existed locally, it would take at least six weeks' notice for any small raids to be mounted from the United Kingdom.

They had produced a lot of first class ideas and even some sketch designs, and they were able, at the same time, to tell the Chiefs of Staff that, if they wanted to mount a brigade against slight opposition and maintain it in enemy territory over the beaches, we could not produce the necessary craft in less than eighteen months or two years.

The reaction to this gloomy report was the placing of an order for 18 personnel-carrying craft and 12 load-carrying craft in the Spring of 1939. The order was still

[1] This fundamental object is strikingly illustrated by the two dioramas—one of the landing of Julius Caesar, the other of the landing in Normandy in the late war, to be seen in the crypt of the R.U.S. Museum.—Editor.

not completed by May, 1940, and, with the exception of four of the personnel craft, we lost those that had been delivered in either Norway or North-West Europe. The effect of this on our existing material organization may be judged when I tell you that it was still necessary in May, 1940, for the Deputy Chiefs of Staff, sitting in joint and solemn session, to give approval for the purchase of one assault ladder costing £11.

WAR REQUIREMENTS

In February, 1940, the Chiefs of Staff asked for an estimate to be made of the numbers of craft required to enable two brigades to be assault landed. The bill for this great adventure was reported then to be: 26 assault craft, 4 support craft, and 18 load-carrying craft, employing perhaps 300 naval officers and men. The bill to-day is difficult to assess, depending as it does on the actual operation, but it has been estimated that to man sufficient ships and craft to land and support indefinitely a similar force, we might need between 10,000 and 15,000 naval officers and men, and the material bill would at least be comparable.

The 26 assault craft were ordered; everything else was deferred. This fact is recounted, not in any spirit of criticism, but to show how different the picture was at a time when we still had our foothold on the Continent. Knowing, as we do, his attention to detail, it is difficult to believe that the then First Lord of the Admiralty was not aware of, and did not approve, the above decision. Within a few weeks, however, we were no longer on the Continent, and the same man, now no longer the First Lord but Prime Minister, wrote, in his typical way, a minute which reads:—

> "Let there be built great ships which can cast up on a beach, in any weather, large numbers of the heaviest tanks."

Those words were written in June, 1940, and must have caused many people in Whitehall to realize that the tragedies that were taking place under their eyes that month were but an incident in our nation's history.

The point I wish to make this afternoon is, of course, that there has been a major change in technique, and a major change in material must, inevitably, follow. At the time of the fall of France, there were no plans in existence for craft capable of carrying even one modern tank. Yet as a result of the Prime Minister's prayer, written in June, a craft capable of carrying three tanks was running her trials in November. She had been built in the Tyne by Messrs. Hawthorne Leslie; but though this firm were the builders of this particular craft, there were thirty more, and many of the other bigger shipyards were similarly engaged, having pooled their technical and drawing office resources.

Even in these early days the possibility of mass production being required was foreseen by these ship-builders, and the sketch designs were soon changed from the rounded bilges of normal ship-building practice to the simpler rectangular construction which has been the standard of all later designs. To quote one of them, "it was necessary to design a ship which could be constructed by the aid of the set-square and a foot rule."

The big picture to be completed in 1944–45 was now being outlined for us. We were back on the defensive in our island fortress, and we knew full well that before the War could be won we should have to fight our way back to the Continent. Two smaller types of British craft, developed in peace time and tried in Norway and France, though not in their proper role, had proved themselves to be efficient and to justify

mass-production. There was, however, still the problem of how to carry them across the Channel and perhaps across the ocean, in suitable tactical units to enable the Army to be efficiently deployed. Thanks to the Prime Minister, larger craft and even greater ships were being designed to carry and land the heavy armour which the German drive across the Low Countries had shown us to be the key to modern war. Much of this was theory, but practical experience soon came to our aid.

In spite of the loss of our precious handful of craft in the previous weeks, the first real raid of the War was carried out by 120 men against the now enemy coast of France on 23rd June, 1940; every man was landed, every man was returned to this country. In fact, the raid achieved nothing, yet it did serve as a full scale trial to show how far behind we were with our material. Civilian-manned R.A.F. high-speed launches were used because there was nothing else. Not unnaturally they proved to be unsuitable; their draught was excessive; their compasses failed, and so did their communications; and, finally, on their way home they were shot up by R.A.F. aircraft.

This sad story was "splashed" by the morning papers, which were read at breakfast time by a large number of very senior officers and Ministers who did not know that the raid had even been planned. I gather that it was a bad morning in Whitehall.

Early Lessons

In September, 1940, the Dakar operation was launched. It was not a strategical success, but it taught us some material lessons. First of all we learnt the need for a special ship to carry the Joint Commanders. Apart from accommodation problems, and the technical equipment which must be fitted in, there is just cause for complaint by the Army Commander if his Naval opposite number decides to indulge in a naval battle at a critical stage of the operation. Such high-handed and unilateral action is, I suppose, almost inevitable if the Joint Commanders are established in a man-of-war which meets part of the enemy fleet. At any rate, this happened at Dakar, and it was repeated at least once more during the War when the American landing took place at Casablanca at the beginning of Operation TORCH.

The second major lesson, though it was not learned practically, was the confirmation of the Prime Minister's forecast that eventually we should have to carry tanks across the ocean and land them on the beaches, unless we captured a port. We were to learn at Dieppe what the latter would entail.

There were, however, many practical difficulties and little progress was made in that Winter of 1940–41. At first it appeared that the larger craft could only be built in the shipyards at the expense of escort vessels or merchant ships. In those rather grim days it was understandable that the Admiralty were finding it hard to prepare for large scale offensives which must have seemed a long way off. The situation was not made any easier by the fact that, although Sir Roger Keyes was the Director or Adviser on Combined Operations, his responsibilities were not defined until the Spring of 1941, and his position must have been extremely unsatisfactory both for himself and for Whitehall in general.

The first real signs of progress appeared when the bigger shipyards prepared simplified drawings of the craft which could be used by the structural engineers of the country—the bridge and crane builders. This tapped a new source of production and took the weight off the shipyards.

Then came the really big step in the form of Lend/Lease and the ability to call upon the resources of the United States to turn our designs into quantity production. I will amplify this later, but would like to give you an idea of the magnitude of the task with which the Admiralty was faced. In 1941, the rate of expansion of the landing fleet in terms of manpower was, first of all, planned to be 500 per cent. in two years; within a few weeks this was altered to 600 per cent. in one year. The Admiralty was fully engaged on its own more orthodox expansion programme, and it is not surprising to find that they handed over the task to what was really a shadow organization in C.O.H.Q. In the middle of 1943 the situation had cleared itself, and at Admiral Mountbatten's own request, he handed back to the Admiralty the control of a force which contained over 60,000 naval officers and men and over 4,000 ships and craft.

I cannot quote the comparable figures to-day, but it may be of interest to know that the naval bill for keeping Combined Operations going is ten times that of the Army which, in turn, is ten times that of the R.A.F. The manpower figures are comparable, but the factor is five instead of ten.

So far I have attempted to tell a chronological story. For the rest of the lecture I think it will be clearer if I deal with a few particular problems and their solutions, one at a time.

Headquarter Ships

As we saw at Dakar, special arrangements have to be made to accommodate the Joint Commanders and their Staffs. There must be a Senior or Force Headquarters Ship, and probably one for each divisional front. Smaller ones may be required at brigade and battalion levels. The larger ones, in which I include those required at Corps and Divisional level, can really only be provided by building a special ship (which I suggest we shall never be able to do) or by taking a valuable fast passenger ship from trade. Whatever ship you use is unlikely to be fully employed for more than a very few weeks and is, probably, one of the most expensive luxuries that the unfortunate shipyards of this Country are expected to provide for Land/Sea Warfare.

The mass of special wireless equipment and machinery, and the complicated internal wiring employ a far higher proportion of the more highly skilled workmen than any other type of ship, and the sad thing is that, at the rate at which we usually progress in electronics during a war, the equipment is out of date before the ship is ready. The technical requirements became so excessive at one stage during the last war that we actually found special ships being required as tenders to the Headquarters Ship, carrying the heavier wireless transmitting equipment, and again as fighter direction tenders.

It is in this class of ship that we can make our best contribution by refusing to go Rolls Royce and fit unnecessary gadgets, e.g., numerous alternative communication channels are easy to add on paper, but one wonders whether they could not be reduced. Joint Commanders to-day must envy the days when a force was out of touch with Whitehall for months or even years.

At Brigade level we were able, towards the end of the War, to use specially converted frigate hulls of which there was, by then, a surplus. These exist to-day.

For the Battalion level, it is necessary to have a landing craft, and the idea here is to use a suitably adapted standard hull which will be able to pay a dividend in its ordinary load-carrying work as soon as the Battalion Commander has landed. As a

measure of the task given to the material departments, it may be interesting to know that the Battalion Commander, in the assault, expects to be able to have no less than nine wireless channels. Personally, I believe that he should be told to get on with two.

Troop-carrying Ships and Craft

As I have said earlier, the small landing craft developed for troop carrying in peace time were accepted as the standard British type throughout the War. It carried approximately a platoon of men and landed them over a bow ramp. Variations were produced in the United States, all of which have their particular points; but, on the whole, we were satisfied with our British craft which, to ease the production problem, was built mostly of wood in the boatyards of this country.

Although this small craft was adequate for the last mile or two of the voyage, it had to be carried, with the troops, to the scene of operations. In the early days, for fast raiding and Commando work we used converted cross-Channel steamers fitted with special davits, and these did good work under the White Ensign—particularly, perhaps, in Norway. For long-range operations their limited fuel capacity produced complications, but they were always fully employed. As the scale of operations grew, larger passenger ships had to be taken off trade and fitted with special davits to carry these heavier craft and be capable of lowering them, fully loaded with troops. In most cases, these ships remained under the Red Ensign, though a Royal Marine or Naval organization was carried permanently to man and maintain the landing craft.

As the U.S. building potential came into play, we gradually replaced this class of ship by standard "Victory" hulls, adapted while still on the slipway. These were used to carry the Infantry for the assault and follow-up waves, and were commissioned as White Ensign ships, which made for a tidier internal organization.

The long term build-up of troops becomes really a simple passenger or troopship problem once the beaches have been captured. Craft which have been used in the assault are provided to unload troopships arriving in follow-up convoys. These need not then carry heavy landing craft, nor do they need a naval ship's company.

The cross-Channel steamers, which I have mentioned as being used for raiding, were very vulnerable to air attack in the close waters of the Channel, and a demand therefore arose for a special type of raiding craft capable of carrying about 200 men for perhaps 24 hours. These were built very rapidly by the U.S. and were extremely useful in many subsidiary roles, but they did not see much service as assault craft as they presented far too favourable a target when beached and landing 200 men down a gangplank. They were, however, ocean going (although they were called craft) and proved quite invaluable for ferry service on the enemy coast. Materially, they were of interest because they used eight small Diesel engines coupled to two shafts, and so tapped the mass-producing internal combustion engine trade of the U.S. They also employed, again in the interest of mass production, the feathering propeller, which cut out clutches and finely cut gear wheels, but I doubt if it was the right decision. There were far too many ropes' ends and snags lying about the assault beaches, and feathering propellers are delicate; moreover, they don't like sand in their bearings.

Load-Carrying Craft

Here again the basic British design of a small load-carrying craft, capable of carrying about 20 tons, proved itself, and was virtually duplicated in the United States. It remains in service to-day in something very like its original form.

The problem was, of course, how to carry these small 20-ton craft to the assault area, and many schemes were employed and even more discarded before they reached the drawing board. Examples of this were train ferries, which launched the craft over the stern ; oilers, carrying 15 of them as deck cargo, with special gantry hoisting arrangements ; personnel ships with ultra-heavy davits (these were not a success), or as deck cargo. Finally, nearly every M/T store ship carried one or two of these craft.

These craft could only be handled empty by their parent ship and, useful though they were, they created many administrative difficulties. There was little room for either the boats' crews or the maintenance arrangements in the merchant ships, and, to produce enough of them to deal rapidly with successive convoys, they had to be left behind. A shore organization on an exposed beach for both men and material then became necessary. The chain of command of these small craft broke down before it was ever welded since the boats and their crews had to be dispersed all over England at the mounting ports where they spent long periods without supervision in small numbers in merchant ships. However, they did invaluable work both on open beaches and in captured or artificial ports and, of course, in the inland waterways of Burma. They undoubtedly have a very real part to play in any South-East Asia campaign where roads and bridges present a modern army with a vast engineering problem.

These most successful small craft were, of course, of no use when it came to landing heavy tanks and, as I have already stated, it was not until late 1940 that the first craft specially designed to carry and land three tanks began to appear.

It was a painful struggle to build up the tank-carrying fleet because, as fast as they came off the stocks, they seemed to be diverted. The Home Fleet at Scapa stole a couple of dozen to carry net defences to protect individual ships at anchor from torpedo-bomber attack. The Eastern Mediterranean was always a bidder, and the pipe-line round the Cape was not only long and expensive, but the craft had to be redesigned so that they could be broken into three and hoisted into merchant ships. Others were used to build aerodromes in the Scottish Islands. Finally, there was the training problem, and there always seemed to be at least a division or corps waiting for Combined Operations training.

Before long we began to study the problem of re-establishing ourselves in Europe, and the coast of France came under very detailed examination in September, 1941. At this time we had hopes of building perhaps 200 tank landing craft.

The outline plan at that time envisaged a three division assault, and because we were limited by the range of fighter cover we were forced on to horribly shallow beaches, for which the original landing craft designs were virtually useless.

Apart from asking for a new design of craft, the planners asked for over 2,000. It was this requirement which led to the structural engineers being brought in for the work and made the help of the United States quite essential.

In the interests of economy of both labour and material, the new British craft were designed for the special and limited purpose of crossing the Channel. We were not to know in those days that our main effort would be in the Mediterranean long before the Channel, and it says a great deal for the design and workmanship (and we must not forget the so-called " amateur " sailors who manned the craft) that they steamed out to the Mediterranean, did upwards of a year's service there, and then the great majority of them steamed home and took part in Operation OVERLORD. Even then their day was not over. They were stiffened and tropicalized, and were

either towed or steamed to the Far East during 1945. The towage was necessary to save the engines, and was carried out by ordinary merchant ships in convoy, without many accidents, or, shall we say, without many recorded incidents.

American Production

Though it was reasonably easy for craft produced in the United Kingdom to be brought to the Channel, the same could not apply to American production. The British design could not be shipped, nor could it be steamed across the Atlantic. The American Services had no sea-going design. We were, however, building three of the great ships originally asked for by the Prime Minister, and a repeat order for six more was placed in the United States. But this, obviously, only scratched at the problem. The complications of the British design made it quite unsuitable for mass production; nor, in fact, was the design suitable for the very shallow beaches.

Three solutions were suggested and tried, all of them based on British design and research work—firstly, a mass produced "great ship" of some 1,500 tons which, we hoped, would meet the beaching requirements. Three hundred were ordered for us in February, 1942. First deliveries started in November, and nearly a hundred arrived in time to take part in the Sicily campaign. By that time the U.S. were, of course, fully in the War, and they manned the remainder and actually built hundreds more for themselves. In 1944 we started to build a British version for our own use.

In practice the beaching draught of this ship was greater than was hoped, and except on favourable beach slopes it had to launch a pontoon causeway to span the gap between its ramp and the beach. I will return to this later.

The production of this American landing ship was interesting. Some were built over 2,000 miles from the open sea, and they used railway locomotive Diesel engines so as to tap a new source of supply. Their clutch was a fearsome thing, consisting of what seemed like a rubber tyre on the crankshaft which, when blown up, gripped the propeller shaft. The manning of this fleet was an immense task, and I came across Commanding Officers whose experience was limited to a postal course at the University and a few weeks on the Great Lakes—but they did the job all over the World.

A second solution was to build a floating dock in ship form so that it could embark two of the biggest craft and steam with them anywhere. A dozen or so were built and were invaluable for many tasks, but not the one originally intended. They were bound to be expensive and complicated ships and could not be produced in the quantities required to solve the problem. Those that were built carried amphibian and small craft and also provided repair facilities—but at a great price.

Finally, a smaller type of craft was built in three sections, each of which was within the capacity of most ships' derricks, and each of which was capable of floating alone so that when unloaded in the U.K. they could be bolted together without the use of docks or slipways. It was also found that these most useful craft, capable of carrying perhaps four tanks, could be carried as deck cargo in the bigger tank-carrying ship and side-launched into the water on reaching the mounting area.

To revert for a moment to the pontoon equipment: this consisted of 7-foot cube steel boxes which could be strung together almost like meccano. For use with the landing ships, it was made up in 150 feet long causeways and either carried on the ships' side or towed. It could also be built up into small floating docks capable of lifting landing craft and coastal craft; and finally into flat-topped barges which, when fitted with an outboard motor, were extremely useful for port lighterage work. Its one disadvantage is the amount of shipping space the steel cells occupy.

RECONNAISSANCE AND BEACH WORK

Though, as I have tried to tell the story this afternoon, troops with their equipment may now have reached the open sea in various types of ships and craft, they have still to be directed to the right beaches. This is primarily a naval responsibility and involves considerable material backing, not perhaps in quantity so much as in quality, of what we sometimes call the "Back Room Boy" type.

To enable the reconnaissance parties, which consist of officers and men of all Services, to carry out their somewhat hazardous work, they may have to be landed from aircraft, submarines, coastal craft and canoes. Each one of these methods of transport and the type of information we expect them to obtain for us require special equipment. With the assistance of great numbers of photographs taken at all stages of the tide, reports are summarized and become the basis on which elaborate and very accurate models are made; this, in itself, is no small task, and requires highly skilled personnel and plenty of time.

When it comes to the actual assault, special marking buoys and beacons must be accurately laid to lead in the minesweepers and landing craft and, later, the follow-up convoys.

We must expect any likely beaches to be mined and covered with obstructions, and here, again, considerable quantities of special equipment and, of course, technical training will be required to clear the beach. The problem is not an easy one, and it may well be that the first footing has to be gained by rushing the obstacles with the craft themselves. Obviously, this cannot continue and, once ashore, specially trained parties of men with special equipment must be on hand. Obstructions and the ordinary hazards of landing on exposed beaches will inevitably present us with a high proportion of wrecked craft and drowned vehicles. Here, again, specially trained teams with ingenious equipment have been found necessary in the past and, presumably, will be required again.

BOMBARDMENT AND SUPPORTING FIRE

The preliminary long-range sea or air bombardment, which is nearly always an essential prelude to the assault, may be of short duration and so not prejudice surprise, or be spread over several days and rely upon its deadening effect to overcome the inevitable loss of surprise. In either case, practically any class of H.M. ship is capable of the job without material complications; the same, of course, applies to the Bomber force.

Between the two wars, naval gunfire was not greatly esteemed by the soldier, in fact the Army and the Royal Air Force had much the same ideas about it, though for very different reasons. Nor was naval thought greatly perturbed by this lack of respect, as bombardment produced complications, not the least being that anti-ship shell is not at all suitable for ground work, and the lack of stowage space prevents the carrying of both types in adequate quantities. However, practice soon overrode theory, and from Dieppe onwards there was always a steady call for naval gunfire during the approach and early stages of the land battle. A large proportion of this fire was given by battleships, cruisers and destroyers, without in any way interfering with their normal capabilities. A surprisingly high proportion of the total expenditure

of naval ammunition during the last war was fired in land/sea operations. The following figures cover the first four years only and illustrate my point :—

Calibre	*Percentage of total ammunition expenditure*
14 in., 15 in. and 16 in.	65
6 in....	50

Unfortunately, I cannot find the figures for the last two years, but the percentages are almost certain to be higher as there were comparatively few ship v. ship actions after September, 1943, and assault landings became more common.

To make for closer co-operation between the Services, we saw the introduction of Forward Observer Teams provided by our Royal Artillery, who were embarked, to all intents and purposes as part complement of potential bombarding ships' complements, so as to be always on hand should need arise. These teams, which exist to-day, had their air liaison counterparts.

From the material point of view, all that was required was the production of the necessary types of shell and to exchange it for the anti-ship shell normally carried by warships. For prolonged or long-range operations, arrangements had to be made for changing guns and barrel liners, and the supply of such very bulky items was a very serious problem when they had to go by a long sea route as, for example, round Africa to the Eastern Mediterranean.

As the leading waves approach the beaches, heavy bombardment must lift and we come to the first really critical moment of the operation. The soldiers' own close support weapons are still hamstrung in the landing craft, and substitutes must be found.

Rockets, naval guns, field artillery, light flak and mortars have all been used in their time, and will inevitably be used again. Standard landing craft hulls are quite capable of being adapted for the purpose, and at one time in the late war we had over a hundred of the largest types alone so modified. Beyond imposing yet another strain on the hard-pressed dockyards to make the structural alterations, they did not produce any major or novel material difficulties. They did, of course, require radar and fire control equipment, which call for more skilled labour both to install and maintain.

AMPHIBIANS

Many of the Land/Sea Warfare problems can, of course, be solved by the use of Amphibians, which came into their own so noticeably toward the end of the War.

To begin with their disadvantages: they are, individually, more complex to build and require greater maintenance; they are bulky, and this not only reduces the number you can bring to the scene of operations, but presents a larger target and leads to traffic difficulties ashore; if they are tracked to give a better performance on some types of surface, they cut up the roads and beaches; finally, they are of no peace-time commercial value, and in war they compete with the tank production.

On the other hand, they land their troops dry-shod; they are less likely to broach to, and when entering the water again, can do so bows to the sea; if used to carry the lighter supporting weapons for the Army, they can drive right inshore and take cover. For dealing with packed stores, such as ammunition and food, they are quite admirable since they can take their load to a fixed transfer point just inland of the beaches where the lorries do not have to compete with the difficulties of a sandy

beach and the vagaries of the tide. By rigidly restricting them to this very short turn-round, and insisting upon very strict maintenance routine, they are undoubtedly a satisfactory answer to many of our problems. The Dukw, with a 2½ ton load, landed 55 per cent. of the stores and equipment at Arromanches.

From the practical point of view, however, we must remember that this Country cannot do everything, either in peace or in war. If we are unsupported by Allies, we cannot afford to waste our great boat-building industry, and this will inevitably force us to make the maximum use of craft. If we can tap production resources outside the Country (and I do not see how we can carry out a major Land/Sea Warfare campaign without outside resources) then I think we shall want to use amphibians.

In spite of this apparently complacent attitude, I can say, however, that we are not sitting back, and while I doubt if we shall ever see vast numbers of British amphibians in action, we shall certainly have enough to experiment with and from which to learn a lot.

MAINTENANCE

I am afraid I have omitted many things about which you may have expected to hear this afternoon, including, of course, the enormous effort put into such things as Mulberries[1] and even floating aerodromes[2], though the latter were never actually produced. The complications of waterproofing army equipment so that it can wade to five or six feet in sea water; the development of duplex drive for tanks so that they can accompany the small assault craft and gain surprise; all these and many others produced their problems, both in material and planning.

Before closing, however, I would like to mention the maintenance organizations that must go up as material is deployed all over the World. There is a difference, and an important difference, between day-to-day maintenance and major repair facilities. It is my opinion that we have tended to waste considerable effort on what were really major repair facilities which were, in fact, seldom used. We lost less than 10 per cent. of our major ships and craft, and perhaps 20 per cent. of our minor craft during the whole War. Repair facilities are unlikely to receive assault convoy priority, and by the time they arrive the peak period is over, and the problem is often what to do with the landing craft. I do not, of course, include landing ships, but you cannot improvise major repair facilities for landing ships in the assault area.

Day-to-day maintenance is a completely different kettle of fish, and we came near to solving it at the end of the War when we were able to provide sea-going maintenance and depot ships specially for landing craft. These can operate right up in the assault area almost from H-hour, and you achieve the greatest possible economy of effort. Not the least of these economies is the fact that you reduce the number of so-called "sailors" who have to live ashore, and do so most extravagantly because they are not trained or organized for it.

CONCLUSION

Combined Operations Material and Technique have both, I believe, passed through their most complicated phase.

A headquarters ship; a "great ship capable of casting up large numbers of the heaviest tanks"; a smaller but similar ship to act as a spearhead to the attack

[1] See "The Prefabricated Harbour"—Lecture by Rear-Admiral H. Hickling, C.B.E., D.S.O., in the JOURNAL of August, 1945, p. 291.

[2] See "Seadromes" by G. Oswald Williams, in the JOURNAL of May, 1935, p. 343.

and give dispersal ; and, lastly, either craft or amphibians to land the troops and their lighter equipment—these four or five basic types, with minor modifications to meet the few special requirements, should enable the Army to enter any enemy territory providing we have command of the sea and of the air.

It is the last of these—command of the air, which offers the most likely source of new technique. If air power can lift in the assaulting waves for us then the Land/Sea Warfare problem becomes considerably easier. Many material complications will become unnecessary and we shall be able to concentrate on the rapid build up. In fact, it represents one more turn of the wheel of progress and would, I suggest, enable offence to overtake defence which is, perhaps, leading the armament battle to-day.

Here, however, I must add a note of warning : it is far too easy to see all our difficulties and none of those facing the enemy. Sea power, and now air power, when properly used, give initiative to the attacker ; obviously the defender cannot defend everything everywhere on the European coast line. Given initiative and bomb-proof waterways for our communications instead of continental roads and bridges, which are not bomb-proof, there is no reason to think that our three Services cannot continue to do all that national policy demands.

DISCUSSION

CAPTAIN R. H. F. DE SALIS, R.N. : I should like to stress the importance of support and maintenance of the assault forces, particularly the maintenance of the men. The question of food and particularly water for men employed on the lighter forms of assault craft for some days after the assault has taken place, is a very important one. I think it may be realized now, but perhaps it was not quite fully realized in the last war.

The assault craft in OVERLORD were provisioned for several days, but they went on for many weeks, and I had large numbers of assault craft, for whom no provision had been made, coming alongside all the time and asking for nothing but food and water. It is very important that that should be borne in mind.

The material maintenance was very well done. The rest for the men, particularly the men working in the smaller boats, was very well thought out, and they managed to carry on all right. But I think there was a little over-confidence that they would get back to some form of base earlier than they did, and they definitely did run out of food and water. That is a point that no doubt has been borne in mind.

THE LECTURER : I was afraid that I was running short of time, and I cut my remarks on maintenance considerably.

I agree entirely with Captain de Salis. I suffered from the same thing in the Mediterranean, possibly even worse, but the solution which was in force at the end of the War—as far as the Japanese war was concerned—was that instead of having an elaborate organization ashore, the tendency was to put it afloat. We finished up with what most of us know as depot ships—submarine depot ships, destroyer depot ships, and we had maintenance ships for landing craft. Instead of calling them landing craft depot ships in the ordinary naval parlance, they were called " maintenance ship (landing craft)."

That is the solution. They can go in practically at H-hour, and should be able to feed and look after the troops.

CAPTAIN R. C. TODHUNTER, R.N. : I had a good deal to do with the material side of Combined Operations from the very early days, and I very much enjoyed hearing Commodore Grindle's lecture.

Towards the end of the War, when we were considering the question of looking after landing craft crews in the Pacific Campaign, because there were not enough ships available—or at any rate we could not get them—as depot ships, Commodore Grindle will remember that we had, first of all, some things called " Molcabs "—Mobile Landing

Craft (Advanced Bases), which were substitutes for ships. These were designed to be carried in L.S.T's (both men and material) and to establish shore bases for crews.

Because "Molcabs" were known to be a bad substitute for depot ships, we had also a scheme for some floating "arks" which had to be made of concrete, for lack of steel. The idea was that these "arks" should be towed out to the scene of the assault and they would provide accommodation for the crews of all the landing craft there. At one time there was a suggestion, which was dropped because of lack of facilities, that in addition to "arks" to accommodate the crews of small landing craft, there should also be "arks" fitted as power stations, refrigerated stores, workshops, etc., etc., to provide all the things so desperately needed in the early days in captured ports where all facilities had been destroyed. I would like very much to know whether anything more has been done about the "arks" and the "Molcabs."

To turn to a different matter, some of us always felt that infinitely better L.S.T's could be built than the existing L.S.T.3, which had been designed round the only engines available at the time. I have often wondered whether anybody has since persuaded the Treasury to produce the necessary money to build a prototype of a better class of L.S.T., which would do all the things we wanted to do in the past.

THE LECTURER: The "Molcab" was used in Operation ZIPPER. I do not believe it is the right answer. For one thing we were not able to phase it in with the convoys.

The difficulty of any operation is to find enough land for the Army's base maintenance area and port facilities. If you put naval overheads on to that, it only makes the problem even more difficult. I am sure that the right answer is for the Navy to stay where it is meant to stay, and that is afloat. I believe it would be cheaper to use ships to accommodate naval officers and men than to try to put naval officers and men ashore, competing for valuable space. In all occupying operations, space is at a premium.

The functions of the "arks" were partially taken over by the depot ships. There is no mention of "arks" to-day.

I think we have to remember that it will be a long time after the outbreak of another war before we have to do a very major operation, and it should not be difficult to produce what I hope experience will show is a very simple type of craft.

With regard to power stations, I think that is the right answer. We had frigates specially designed for power stations at Singapore, if I remember rightly. Here again, it is the sailor who should stay afloat.

On the subject of L.S.T's, when Captain Todhunter retired to softer fields he left behind a large fleet of what are now called L.S.T.3's, and they are what we have at the moment. Sketch designs for improving the L.S.T.3 are always on paper, but that is all. I hope they will be improved.

CAPTAIN G. R. G. ALLEN, R.N.: I think that one of the most important things we learn from this lecture is that the technique of combined operations has now entered into Service language, not only that of the Navy but of all the Services. I hope that developments in this field will be increasingly subscribed to by all the Service Ministries; but, as the Lecturer pointed out, the Navy has always got the biggest bill to pay because of the expense of the equipment which it has to use. The fact that Combined Operations Headquarters has become a permanent part of our Defence set-up should serve to keep attention focussed on these matters.

Before the last war, the opinion was widely held that combined operations would be virtually ruled out in the future owing to the advent of the air weapon. It was not until we had taken the heavy knock in France that we came to recognize the imperative need to develop this form of warfare. What followed exceeded anybody's imagination.

I think there is one note of warning that we ought to sound here. It is that in its early days in 1941–42 the Combined Operations organization grew up without, as the Lecturer said, any comprehensive directive from the highest authority. It was not

until Admiral Mountbatten handed the naval organization back to the Admiralty in 1943 that this could develop on a sound basis within the fold of regular naval administration. Meanwhile, those who served in Combined Operations will be aware that the personnel engaged were regarded slightly as, shall we say, poor relations of the regular orthodox Navy—very useful for certain purposes but, when those purposes were not to the fore, relegated to the background. I hope that with the present day set-up such a situation will never arise again. The Combined Operations Service is as much a part of the regular Services as the Navy's Submarine Service or any other specialized arm, and deserves to be recognized as such. It seems quite clear that whenever we may be engaged in war there will always be a requirement for Combined Operations, though possibly of a different kind to those of our past experience.

THE LECTURER: To take Captain Allen's first point, I think there is no doubt that the cause of the situation he mentioned is that Combined Operations was set up as a shadow organization, and the speed of expansion was so great that the personnel had to be content with shortened courses and came out as, for example, "Able Seaman (Combined Operations)." That state of affairs is dead, and I see no reason why it should ever be revived. To-day we are running a training squadron, and the men are active Service personnel who can take their draft in turn.

As regards the water gap, that is a headache. As long as the Army wants more tanks, the water gap gets bigger. This is going on all the time. Captain Allen knows that only too well, as I took over from him a year ago.

THE CHAIRMAN

I do not propose to keep you for more than a few moments. There seem to me to be three points which stand out in what the Lecturer has told us.

First, he said that the R.A.F. was and had been the junior partner in combined operations. During the course of this week, I think, there was on the back page of *The Times* a picture of the Wright Brothers' aeroplane; after all, it is only fifty years since men started to fly. The Lecturer pointed out that the first part of an assault might well be a land-air operation. I believe that in the future we shall see a tremendous alteration in the technique of the assault, and I do hope that all the Services are going to take an equal part in working out that technique, because it seems to me that in an atomic age we shall have to move with speed, and it is doubtful, even if we want it, whether we should have the ships and craft on the necessary scale for combined operations.

The second point is that I think it is absolutely vital that we should have the technique and the material problems decided hand in hand. Otherwise it is likely that we shall find that it is not possible for the heavy equipment to be carried. It does seem to me that possibly in the future the equipment will have to be broken down and assembled at the other end and not necessarily taken over in one piece.

The third point I should like to make is that in all our thoughts we surely must have a unification of ideas in technique, material and equipment with any Allies with whom we may be going to fight.

In conclusion, I know that you would like me to thank Commodore Grindle for his very interesting talk. (*Applause.*)

THE SECRETARY (CAPTAIN E. ALTHAM, R.N.): Our Chairman to-day is deputizing for Major-General Festing, who has been called away by a bereavement. He came in response to a very late S.O.S. which I sent him this morning. Therefore, we owe him a special debt of gratitude.

We have been lucky in getting at such short notice Major-General Thomas, who has so wide an experience of the subject which has been dealt with this afternoon. Therefore, I feel sure you will wish to show your warm appreciation. (*Applause.*)

THE PHYSIOLOGICAL PROBLEMS SET BY MODERN WARFARE IN REGARD TO THE FIGHTING MAN

By Brigadier A. E. Richmond, C.B.E., K.H.S.

On Wednesday, 27th October, 1948

Air Marshal P. C. Livingston, C.B., C.B.E., A.F.C., F.R.C.S., K.H.S., in the Chair

The Chairman introduced the Lecturer

LECTURE

THIS subject covers so vast a field as to preclude its detailed consideration in one lecture and I can do no more than attempt a simple classification of the sources of the problems set and select for discussion a few which may be of interest to my audience.

Before settling down to my task I have some preliminary remarks to make. Firstly, there may be a possible implication in the title to some that modern warfare alone is productive of problems and that they did not exist in the past. In this connection, although they may in times gone by have differed from our problems of to-day, they were nevertheless present though more frequently undetected or unrealized.

Secondly, while my terms of reference concern physiological problems, the dividing line between these and problems of a psychological nature is so diffuse and indistinct that they must in a material degree be considered together.

Thirdly, while some minor defect of, perhaps, clothing or equipment may affect physiological function to such small degree that the efficiency of an individual is prejudiced only to the extent of, perhaps, one per cent., yet this in a division is equivalent to the loss of some 50 to 75,000 man days in the year, or the permanent loss of one man in every hundred. I leave you to draw your own conclusions.

Fourthly, physical and mental efficiency go hand in hand with positive health, and to the latter are closely linked happiness and well-being. Clearly then measures of a utilitarian nature aimed at ensuring maximum physical and mental efficiency contribute at the same time to health and well-being. They have, therefore, a humanitarian aspect as well.

It is equally clear that such measures must be of material assistance in the maintenance of morale.

Finally, I feel a reminder is necessary that research into the human problems which we are to consider is termed " personnel research," and we want to be clear in our minds as to what is meant by this term. A useful definition accorded to it by the Medical Research Council is as follows : " Personnel research connotes in relation to the fighting Services the study by physiological and psychological methods of the best means of increasing the operational efficiency, safety and comfort of sailors, soldiers and aviators under different environmental conditions, and conversely the adaptation of ships, fighting vehicles, aircraft, weapons, clothing and equipment to the convenience and capabilities of those who have to use them."

The making of war inevitably means increased stress on the fighting man as compared with the civilian in his civilian avocations. In these days, by improved hygiene, the fearsome incidences of disease which were features of campaigns of the

past have largely disappeared. In their place, however, are adverse effects on health and efficiency which tend to grow on account of the additional stress of modern war. This is due to its increased tempo in general and, in particular, to the greater multiplicity, complexity and effects of present day weapons and the extending spheres of operations with their extremes of climate and terrain, to the evolution of special types of combat, such as tank warfare, airborne operations, commando activities, combined operations and the like and, finally, to the impacts on efficiency of the defensive measures dictated by chemical, atomic and biological warfare. Translating the tale into simpler language—the individual and communal environment of the soldier in warfare of to-day is a great deal more severe than it has been in the past. My hope is to show you, albeit briefly and superficially, some of the ways in which, on this account, the soldier's efficiency may be affected.

It will in the ultimate be apparent that excessive energy expenditure of body and/or mind with ensuing fatigue are the end results of many of the strains and stresses to which my lecture will refer and perhaps an appreciation of the following facts will help towards a better understanding of what I have to say.

First, a calorie is the amount of heat required to raise the temperature of 1 kilogram of water by 1° C. (*i.e.*, the kilogram-calorie). This is distinct from the small calorie (gram-calorie) which is the heat necessary to raise the temperature of 1 cubic centimetre of water 1° C.

Secondly, when physical work is done heat is generated in proportion to the energy expended and is capable of measurement, and the following table gives you information, in terms of calories, as to the energy expended in the carrying out of various typical duties which the soldier may be called upon to perform.

ENERGY EXPENDITURE IN CALORIES PER HOUR OF THE AVERAGE MAN ENGAGED IN VARIOUS OCCUPATIONS

	Calories per hour
Sleeping	71
Standing at ease	76
„ „ attention	90
Sitting (Lectures)	86
Marching (Drill order = 15.3 Kg.)	320
„ (Battle order = 20.5 Kg.)	380
„ (Full kit = 25.0 Kg.)	412
Squad drill (without arms)	156
„ „ (with arms)	230
Company drill	230
Entrenching	321
Assault	382
Bayonet exercise	215
Physical exercise	250
Musketry	177
Arms drill	142
Field work	330
Route march	460
Fatigues	240

Thirdly, the calorie value of the total work performed by the body must be replaced by food of at least an equivalent combustion value if the health of the individual is to be maintained.

Fourthly, fatigue—defined as a diminished capacity for work, is of two kinds, muscular and nervous, and the normal fatigue picture is a combination of these in varying proportions depending on circumstances. Fatigue is a most important factor in the lowering of morale.

Fifthly, fatigue is to some extent capable of measurement, but only by estimating efficiency of performance of the fatigued individual and comparing it with the normal performance when not fatigued.

Finally, the mechanical efficiency of the body is only some 14 to 20 per cent., though in the leg muscles it may be as high as 33 per cent.

THE PROBLEMS

Consideration of the sources of our problems may perhaps be aided by the next table :—

SOURCES OF THE PHYSIOLOGICAL PROBLEMS SET BY MODERN WARFARE

A. Meteorological.

Extremes of temperature.
Excessive humidity, rain, snow.
Changes in barometric pressure.
Changes in partial oxygen pressure.

B. Terrain.

Arctic.
Mountain.
Desert.
Jungle.

C. Clothing & personal equipment.

Ordinary clothing.
Combat clothing.
Special tropical clothing.
" arctic "
Web equipment.
Steel helmet.
Body armour.

D. Special equipments transport & weapons.

Load carrying equipment.
Individual transportation equipment.
Small arms of all kinds.
Mortars.
Artillery.
Army fighting vehicles.
Signals & radar equipment.

E. General operational conditions.

Living & working conditions,
1. Ordinary.
2. Special.
Food & water.
Work.
Mechanisation.
Enemy action,
1. General.
2. Special.

F. Special operational conditions.

Land air warfare.
Combined operations.
Commando warfare.
Chemical "
Atomic "
Biological "

It will be observed that the classification here given details various factors of moment in the communal and the individual environment of a force in the field. In this classification and in our later consideration of specific problems that arise, little or no attention is paid to the effect of enemy weapons, for the reason that such effects, apart from their results on morale, are productive in the main of frank injury and death, and with such matters, just as with frank disease and death, we have no concern in this lecture. It is in adverse effects on positive health and efficiency, mental and physical, that our present interests lie, although it has to be admitted that the dividing line between positive health and frank disease is often indefinite.

It should be observed finally that as regards chemical, atomic and biological warfare our concern is with the clothing and equipment to be used against these types of warfare rather than with the pathological results of such measures of offence.

Human problems are to be found in connection with everything which forms part of the environment of the fighting man—from flit guns to tanks, from a shoelace to body armour, from a foxhole to a barrack, from a Spring day temperature at home to extremes of cold and heat in the Arctic and the Tropics. However, as I have already stated, I must confine myself to a small selection of specific problems which arise, and we will in the first instance deal with some of the more important points in connection with clothing.

CLOTHING

Clothing must be capable, in addition to its other functions, of standing up to very hard wear and tear and, in bringing material and design into line with these requirements, it is not difficult to overstep the mark and adversely affect efficiency. Physiological problems in regard to such clothing will in the main comprise the following :—

(i) Too great or too little loss of heat depending on the climatic conditions, and consequent lack of maintenance of optimum body temperature.

(ii) Insufficient protection from the effects of climate and injury.

(iii) Interference with movement, which on account of the additional energy cost in carrying out a given task will increase the heat production of the body as also fatigue.

(iv) Excessive weight adding unnecessarily to the load carried, and causing fatigue.

These problems have all been in evidence in the past but have been largely mitigated by scientific study and attention to material and design. The battledress is an undoubted advance on the old types of uniform in which our men had to fight, but further research and development may result in still greater improvements.

Arctic Problems

Arctic clothing presents special problems. It must provide insulation against extremely low temperatures and protection against snow, rain and wind. It must at the same time be so designed that the heat engendered in the course of active work, with its attendant perspiration, can be dispersed by some satisfactory system of ventilation. In addition, in view of the great divergencies of temperature met with on any one day in certain seasons in the Arctic, it must be capable of adjustment to the needs of the moment.

British views favour the layer system with control of body temperature by removal of exterior clothing or by addition of extra layers. Some means of controlling ventilation combined with the foregoing to minimize the collection of sweat in the underclothes is also advantageous. Interference with movement is unavoidable in clothing of this nature as is also excessive weight, and at present it has been impossible to reduce the weight below some 24 lbs. complete with foot and hand gear.

It will be obvious that interference with efficiency must be very great even though advances be made as time goes on, and that in arctic warfare the manpower requirements for a given task may well be much more than those of a temperate climate.

Tropical Requirements

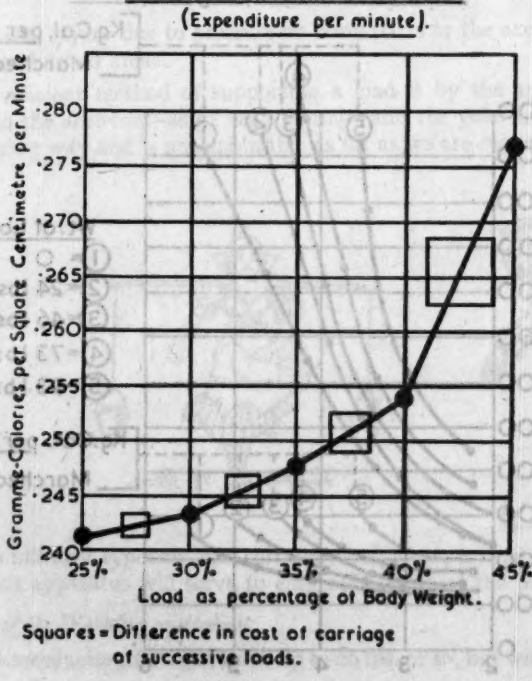
In tropical climates the important functions of clothing for the purpose of this lecture are :—

(i) Protection from the sun's rays ;
(ii) Protection from injury ;
(iii) Protection from insect bites ; and
(iv) Maintenance of the optimum body temperature.

To effect the latter the proper dispersal of heat from the body is all important and this unfortunately may be prejudiced by the qualities of material and design necessitated for the other purposes referred to. For instance, mosquito-proof material, on account of the closeness of its weave, may well fail to allow of a sufficiency of heat loss, and the development of a material which will allow of adequate heat disposal and at the same time be proof against mosquitos is important. Failing that the answer to this, as to other problems of a similar nature, must lie in the best available compromise.

LOAD-CARRYING EQUIPMENT AND LOAD

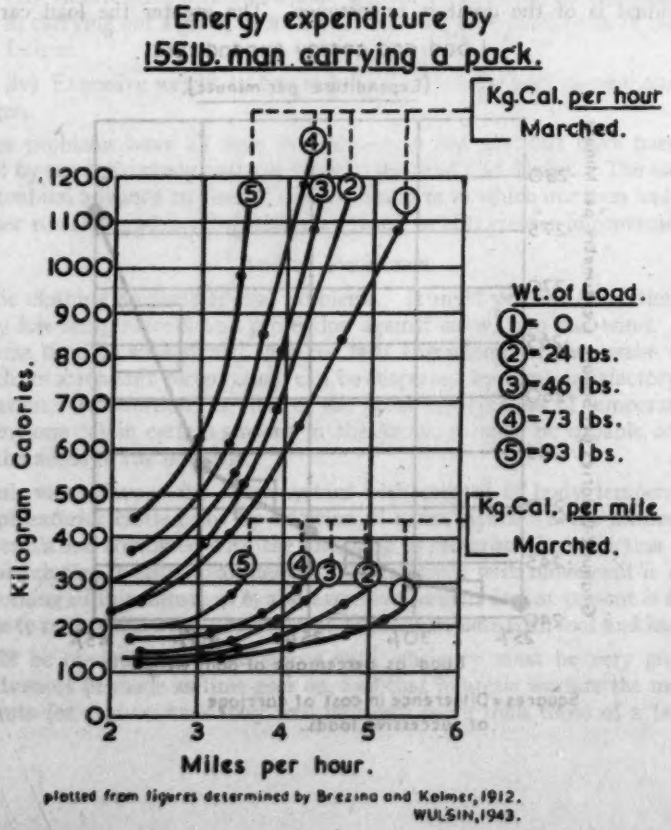
Modern warfare with its attendant mechanization has reduced the load to be carried by the man to some extent, but in terrain inaccessible to vehicles, such as mountains, jungle and in other special circumstances, the load-carrying capacity of the individual is of the greatest importance. The greater the load carried the



greater the energy expenditure and consequent fatigue, and the greater and more speedily produced the loss of efficiency. Therefore to maintain maximum fighting efficiency the load imposed on the soldier requires to be carefully watched and reduced to the minimum compatible with the military requirements of the situation. Professional porters may carry 200–300 lbs. for 10 miles a day.

In the 1914–18 War the soldier not infrequently carried 80 lbs. for as much as 20 miles a day. This is only a little short of double the most economical load, which is about 30 per cent. of the body weight, i.e. 42 lbs. for a man weighing 140 lbs. It is also much in excess of the effective maximum which is 45 per cent., or 63 lbs. for the same man. More recently, taking it by and large, a reduction to some 55–60 lbs. has been effected, but in certain conditions the soldier's load still reaches 80 lbs. or more.

Special circumstances such as mountain warfare and other types of rough going must increase the adverse effects on efficiency mentioned, and in this connection it must be borne in mind that every action in which weight rests even momentarily on one foot involves a very exact balancing action between sets of opposing muscles. A heavy load, especially if badly packed, greatly increases the work of these and inequalities of ground, or slippery surfaces upset equilibrium, increase energy expenditure and reduce locomotive efficiency. An example of this is a tread-mill experiment in which metabolism was increased 75 per cent. when the surface was greased. As the speed was constant, locomotion was reduced by 25 per cent.



In mountain climbing additional mechanical work is done owing to raising the load in addition to moving it forward. In normal walking also it should be remembered that the body is raised a little at each step and some 20 per cent. of energy expenditure is accounted for in this way. If heavy loads are carried this becomes uneconomical and the individual changes his normal type of gait.

Apart from the actual weight of the load, the distribution is of great importance, as also bulk. In general :—

(*a*) the load should be as near the body as possible to bring the centre of gravity forward and thus increase static efficiency and turning ability ;

(*b*) should be carried as high on the shoulders, or man pack, as possible to bring it further forward ;

(*c*) should be loaded lengthwise and close to the axis about which most of the rotation will take place.

(*d*) bulk (as distinct from weight) should be reduced as much as is practicable.

The equipment designed for load carriage must, apart from other requirements with which we are not concerned at the moment, provide all assistance possible in the achievement of the objectives just mentioned. If it does not do so, physical and mental efficiency must be unduly affected and fatigue be prematurely induced in one or more of the following ways :—

(i) Excessive energy expenditure and heat production ;

(ii) Interference with movements of one or more kinds, e.g. respiration, limbs ;

(iii) Local injury due to pressure on bony parts or the exertion of pressure elsewhere on limited areas.

The most efficient method of supporting a load is by the application of the weight direct to the skeleton—as in head carriage and the yoke and buckets ; but it is not the easiest way and is not applicable as far as we are concerned.

As regards military types of load-carrying equipment, a brief consideration of examples of such apparatus will serve to emphasize some of the points mentioned.

Haversack of the Webbing equipment

This is satisfactory for light loads up to 20 lbs. or so, but with weights above

this there is a tendency to more or less acute discomfort owing to the pressure of the shoulder straps. Indeed this is the chief disadvantage of carrying loads attached to a frame on the back. Much can be done by training to overcome it. It is, however, important that in any case the strap should be padded and at least 2½ inches wide.

Rucksack—Bergen type

This is superior to the haversack and includes a capacious bag. The lower attachment of the straps to the part of the frame which curves forward to fit the hip relieves pressure on the shoulders and increases freedom of movement.

For loads over 50 lbs. this apparatus is inefficient, as it is impossible to get the centre of gravity close enough to the spine,

YUKON PACK BOARD

EVEREST CARRIER

Everest Carrier

This has somewhat similar defects to the rucksack, but has with the rucksack the advantage of a space between the back and the load which allows of ventilation.

Yukon Pack Board

This is better than the Everest Carrier for loads over 50 lbs., but ventilation is not as adequate. The pressure on the back is well distributed and owing to the shape of the frame it is possible to bring the centre of gravity of the load higher up and further forward, particularly with bulky loads. The posture of the body, too, is more erect.

METEOROLOGICAL CONDITIONS

Extreme conditions of heat and cold are productive of physiological and psychological stress on the fighting man.

Considering hot climates first: the soldier may have to contend with desert heat of 125° F. and sun temperatures of 160° F. or more, or with jungle heat of 90° F. coupled with very high humidity. As already indicated, when work is done heat is produced and if it is not dispersed the body temperature rises. At rather below 102° F.—the normal temperature being 98.4° F.—work becomes inefficient and hyperpyrexia supervenes. It is then the inadequate loss of heat from the over-heated body which produces acute stress with resulting inefficiency and which leads at

times to the pathological conditions of heat exhaustion and heat stroke, and it will be of interest to give somewhat more detailed attention to the mechanism of heat loss. Heat is lost by convection, conduction, radiation, and evaporation. With an air temperature above that of the skin, heat is gained by the body by convection and not lost and, if the surrounding objects are also of that temperature, conduction and radiation inevitably add to the heat load of the body. Under such circumstances all heat loss must be by evaporation. This being the case then, to compete with the situation—

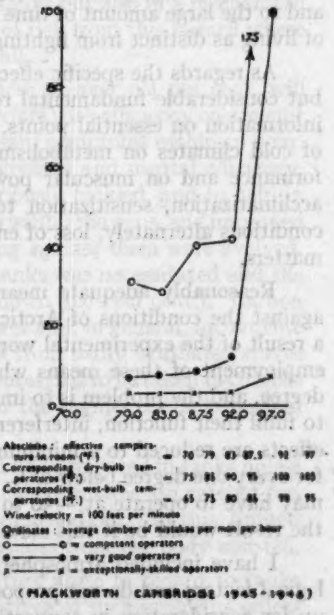
(i) the body must produce enough sweat ;

(ii) the atmosphere must be capable of evaporating it.

As regards the former, dehydration and salt depletion have to be contended with, hence the need for sufficient water and salt intake. Evaporation depends on humidity and air movement and these two factors are of the very greatest importance.

Time does not allow of consideration of measures of prevention against the effects of heat with which we are all familiar, but I must mention acclimatization. Acclimatization to heat takes a comparatively short time, and is in fact largely completed in 7–10 days and is complete in three weeks, though normally in the case of troops we stipulate one month. In the acclimatized man a high body temperature is produced at a much higher level of energy expenditure than would be the case with the unacclimatized individual. He also sweats more easily. Artificial acclimatization may be necessary and was practised by the Germans.

EFFECT OF HOT CLIMATES ON WIRELESS-TELEGRAPHY OPERATORS HEARING AND RECORDING MORSE MESSAGES, SHOWING GROUP VARIATION IN PERFORMANCE



(MACKWORTH CAMBRIDGE 1945-1946)

Hot climates by virtue of physiological and psychological stress produce other less immediate effects than those just mentioned. In general, vitality becomes gradually depressed as time goes on, particularly in those parts of the Tropics with high temperatures and excessive humidity and with no distinct division into hot and cold seasons ; at the same time both physiological and psychological efficiency declines.

Turning to extreme cold, a broad subdivision of cold climates is as follows :—

(i) *Continental.*—Here it is dry and cold, and there is snow everywhere with temperatures down to —60° C.

(ii) *Alpine.*—This is characterized by dry cold weather, with the temperature as low as —30° C. and snow occasionally below 3,000 feet.

(iii) ***High Altitudes near South Coast of Europe.***—This is a variable and humid climate with temperatures varying from +15° C to —30° C. Rain is common below 6,000 feet and the snow line is at about 5,000 feet.

To these conditions must be added wind, possibly up to 100 miles per hour, and startling temperature changes at times, e.g. of 60° F. Wind is of particular importance in that it causes a material increase in the adverse effects of cold. Damp cold too is worse than dry. A night in wet clothes at —6° C, particularly if windy, may be fatal. At a similar temperature but with dry clothes and no wind, probably not much damage will be caused. Frost-bite will occur at —13° C. in still air and —6° C. in a 15 miles per hour wind.

The psychological effects of cold are of special moment, inasmuch as depression and intolerance to one's fellow men may occur, coupled with a numbing effect on the mind and a tendency to disregard orders and directions. I must stress here the great importance of selection and training in minimising these factors which are so very adverse to efficiency.

Apart from the adverse results of climate *per se* we have the prejudicial effects on fighting efficiency due to the protective clothing, to which I have already referred, and to the large amount of time and effort that has to be devoted to the mere object of living as distinct from fighting.

As regards the specific effects of a cold climate, there is much still to be learnt, but considerable fundamental research is in progress which will provide additional information on essential points. We do not know nearly enough about the effects of cold climates on metabolism, on food and water needs, on dexterity and performance and on muscular power. We are also too ignorant on the subjects of acclimatization, sensitization to cold, the effects of exposure to cold and warm conditions alternately, loss of energy after long residence in cold climates and other matters.

Reasonably adequate means exist by which the individual can be protected against the conditions of Arctic climate and these are being gradually improved as a result of the experimental work which is going on. As already indicated, it is the employment of these means which reduces efficiency in the Arctic to such a great degree, and the problem is to improve them to such an extent that, while continuing to fulfil their function, interference with the performance of work and other adverse effects are reduced to a minimum. I heard the statement made the other day that for every one degree below 0° C. there was a 2 per cent. loss in efficiency. As the man may have to operate at —50 to —60° C. in the Arctic, imagination boggles at what the result would be if this statement were really true.

I have included atmospheric pressure changes under the heading of meteorological factors and do not propose to discuss them at the moment as they will come up for consideration in connection with parachuting, which is dealt with later.

TERRAIN

Extremes of terrain, whatever the type, operate to the detriment of efficiency by necessitating increased energy expenditure with consequent earlier and increased fatigue, both physical and mental. On the march in mountainous country the man has to climb or descend mountainous slopes; he has to negotiate obstacles of various kinds and to compete with unaccustomed difficulties in making progress. While the normal man may expend 2,300 calories during 8 hours active work a day, the mountaineer will expend 4,500. The long-range ski patrol marching 120 miles with a 22,000 feet ascent in six days performs the same amount of work as is carried out in 262 miles in a week of ordinary route marching. Movements in mountains or in other difficult circumstances may be assisted by artificial aids, such as skis

and snow shoes, etc., but these will introduce new physiological problems which must be studied if design is to be the best possible.

It is needless to emphasize the great importance of mental and physical fitness in, and training for, mountain warfare, with particular attention to the development of a high degree of exercise tolerance.

The physiological problems set by the terrains of desert, jungle, and arctic warfare are basically the same and very similar remarks apply.

SPECIAL EQUIPMENT AND WEAPONS

Probably the best example to select from this category is that of Army fighting vehicles, of which the physiological and psychological strains upon their crews have received much study in recent years. A special hazard arises from gun fumes and from engine exhaust gas on account of the presence of carbon monoxide. I mention this first as it is a problem which arises not only with tanks but also in a mechanized army as a whole, to say nothing of a material degree of risk from this hazard where internal combustion engines are not in the picture at all.

Percentages of carbon monoxide in the atmosphere of over 0.4 per cent. will rapidly cause acute poisoning, while lower amounts interfere with efficiency on account of sub-acute poisoning, and 0.1 per cent. causes unpleasant symptoms within an hour. Smaller quantities inspired over long periods affect physical and mental efficiency. On these accounts the problem in tanks had to be seriously tackled, and to help in this research was carried out into actual source of fumes within the guns, and improved methods of removing them by ventilation and guarding against them were evolved. The provision of a simple means of testing for CO in tanks was necessitated and the maximum permissible percentage of gas has been laid down (0.01 per cent.). Carbon monoxide is, as already indicated, a product of explosives and, in general, incomplete combustion in any form is a source of it, hence the risk from badly ventilated stoves in huts. It may be of interest to recall that special measures had to be taken to combat the carbon monoxide hazard in tank landing craft after the engines of the tanks had been started up prior to a landing.

The adverse effects of extremes of climate may well be augmented in tanks unless special measures of ventilation in hot, and heating in cold, climates are catered for. Experiments with a special type of ventilated suit were carried out. In this, limited quantities of air were blown beneath the suit, and heat loss from the body assisted.

Interesting psychological problems of a visual nature arose in regard to tanks and had to be investigated. Interior lighting is productive of such problems unless it is satisfactory and properly distributed. If, too, it is over-bright at night it interferes with dark adaptation. Improvements in tanks in these connections were made by degrees, and latterly red lighting was employed with very good results. Methods of presentation on instrument panels and similar matters necessitated special investigations in war to obtain the best results.

The muzzle flash of the gun affected the gunner's visual capacity, and special investigations were necessitated with a view to combating the trouble. The field of vision, too, may be excessively limited in a tank and special measures have to be adopted to ensure that it is the widest possible, and that blind spots are eliminated as far as is practicable.

Experience revealed an undue limitation of the efficiency of drivers owing to the excessive work performed by them in relation to the rest of the crew for physiological,

anatomical and psychological reasons; for example, the "loading" of pedals proved to be too heavy and had to be lightened, while the range of travel was not optimal and involved unnecessary work. The relation of the pedal position to the seat and of the angle of the thigh to the horizontal, as well as of the leg on thigh is of great importance.

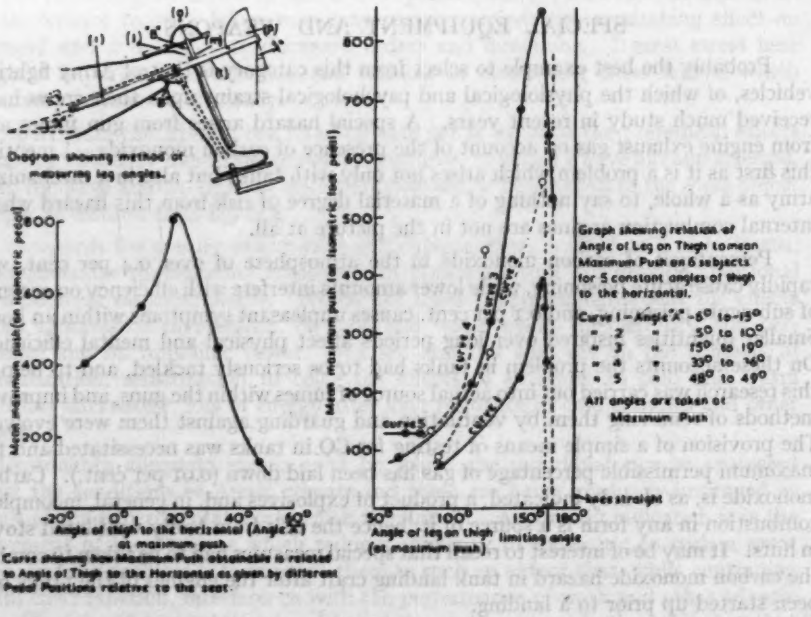


Diagram showing method of measuring leg angles.
Mean maximum push (on isometric pedal)
800
600
400
200
-20°
0°
20°
40°
60°
Angle of thigh to the horizontal (Angle X) at maximum push.
Curve showing how Maximum Push obtainable is related to Angle of Thigh to the Horizontal as given by different Pedal Positions relative to the seat.
Mean maximum push (on isometric foot pedal)
800
700
600
500
400
300
200
100
50°
100°
150°
180°
Angle of leg on thigh (at maximum push)
limiting angle
knee straight
curve 1
curve 2
curve 3
curve 4
curve 5
Graph showing relation of Angle of Leg on Thigh to mean Maximum Push on 6 subjects for 5 constant angles of thigh to the horizontal.
Curve 1 – Angle "X" -6° to -15°
" 2 " 5° to 10°
" 3 " 15° to 19°
" 4 " 33° to 36°
" 5 " 48° to 49°
All angles are taken at Maximum Push

Again, it was found that the load on steering sticks was too great and had to be reduced. From the anatomical aspect, the relationship of levers to seats was not as good as it ought to be and, coupled with inadequate ranges of adjustment to different drivers, involved the man in discomfort in carrying out his job. In addition the driving seat was not optimal, and careful study had to be directed towards designing the most satisfactory type. Psychological strain productive of errors of judgment and of co-ordination resulting in accidents, was associated with factors of design and mechanism.

Of a somewhat different nature is the problem of ensuring the adequate feeding of tank crews, especially in view of the severity of the conditions under which they frequently have to operate.

Finally, it is clear in view of the comparatively small space available for the crew that unless stowage facilities are adequately positioned and arranged for, there is likely to be interference with movement and undue energy expenditure and fatigue in carrying out essential duties. The following are examples of the effect on loading efficiency in a tank of stowage of ammunition in vertical as compared with horizontal bins:—

MEAN TIME IN SECONDS FOR LOADING EACH ROUND; COMPUTED FROM 6 ROUNDS

	"Heavy" ammunition	*Ordinary ammunition*	*Difference*
Vertical bins	8.12	6.80	+1.32
Horizontal bins ...	6.34	5.44	+0.90

MEAN NUMBER OF EXCESSIVE BEATS OF THE PULSE BETWEEN THE END OF LOADING 6 ROUNDS AND THE RETURN OF PULSE RATE TO THE RESTING LEVEL

	Vertical bins	*Horizontal bins*
"Heavy" ammunition	38.7	31.7
Ordinary ammunition	25.4	26.1
Difference	+13.3	+5.6

It will be appreciated that a number of those problems which I have mentioned in connection with tanks will arise also in regard to other forms of armoured vehicles and in fact to mechanical vehicles of many kinds.

SPECIAL OPERATIONAL CONDITIONS

As the time available is drawing to a close we will consider finally a few problems arising in connection with the Airborne Forces.

On the ground, the conditions applicable to the ordinary infantry soldier apply in the main to airborne personnel. During flight there will be obvious environmental conditions productive of stress and strain which I need hardly detail. Certain special problems may, however, be set chiefly due to :—

(1) Atmospheric pressure changes.

(2) Anoxaemia or, in other words, oxygen lack.

(3) Air sickness.

(4) Acceleration and changes of pressure during a parachute drop.

(5) The difficulties inherent in landing after a drop.

Of these, the two first named factors will be of varying degrees of importance, depending upon the height at which the aeroplane or glider flies while on the way to the target.

It is essential to appreciate, in discussing pressure effects, that the higher we ascend the lower the pressure becomes, and at 18,000 feet it is only half that at sea-level. At 45,000 feet it is only 1/7th of an atmosphere, and it is interesting to compare this with the pressure at 500 feet depth of sea, where it is 16 atmospheres.

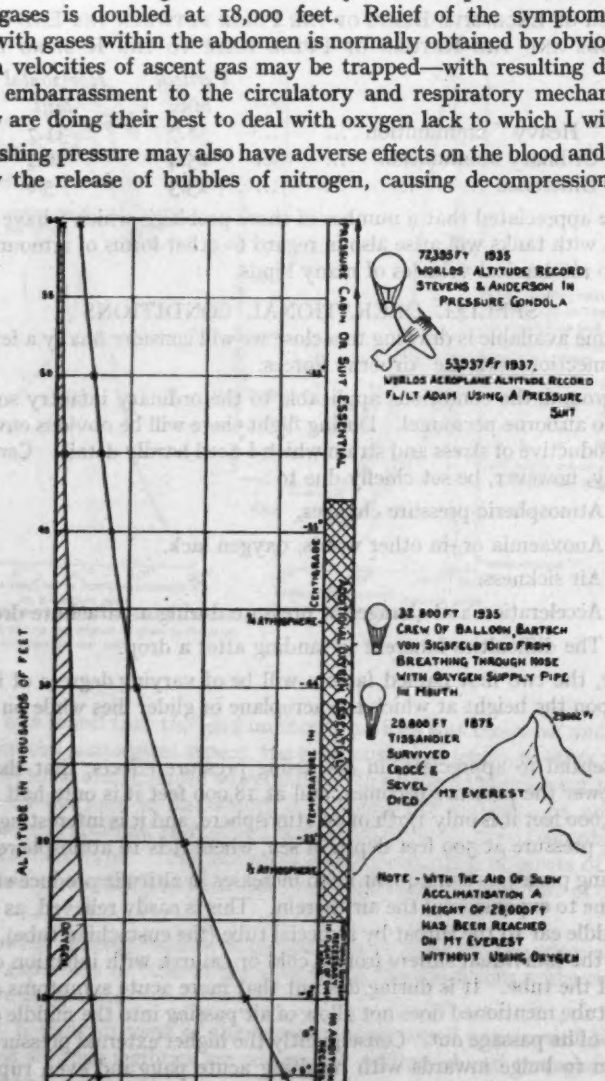
Decreasing pressures consequent upon increases in altitude produce effects on the middle ear due to expansion of the air therein. This is easily relieved, as air can pass from the middle ear to the throat by a special tube (the eustachian tube), but trouble may arise if the individual suffers from a cold or catarrh with infection of the lining membrane of the tube. It is during descent that more acute symptoms are likely to arise, as the tube mentioned does not allow of air passing into the middle ear as easily as it permits of its passage out. Consequently the higher external pressure may cause the ear drum to bulge inwards with resulting acute pain and even rupture. Such troubles are much more likely to occur if there is catarrh of the eustachian tube—hence the importance of not flying while suffering from a cold.

Repeated swallowing, you will remember, during descent aids the expulsion of air through the eustachian tube.

Surrounding the nose are a number of bony compartments connecting with the nasal cavity through very small holes. During ascent or descent the partial blocking of these by catarrh may cause undesirable symptoms.

The results of diminished pressure are also seen in the gastro-intestinal tract in which, as the volume of a gas varies inversely with the pressure, the volume of its contained gases is doubled at 18,000 feet. Relief of the symptoms caused by distension with gases within the abdomen is normally obtained by obvious measures, but at high velocities of ascent gas may be trapped—with resulting discomfort on account of embarrassment to the circulatory and respiratory mechanisms, which incidentally are doing their best to deal with oxygen lack to which I will refer later.

Diminishing pressure may also have adverse effects on the blood and tissue fluids, particularly the release of bubbles of nitrogen, causing decompression sickness or



" bends." This, however, is not of great importance except in very high flying with rapid ascent rates.

The higher we go the less oxygen there is in the atmosphere and, while at sea-level the pressure of this gas may be about 100 mms. of mercury, at 15,000 feet it is reduced to 50 mms. Anoxaemia is therefore an important physiological problem at high altitutes. At heights of 6,000 to 10,000 feet minor symptoms of oxygen lack may occur and it will be found that respiration and heart beats are accelerated. At 10,000 to 14,000 feet these effects are more marked and sinusitis may be evident together with, possibly, headache, lassitude, mental depression, insomnia and other troubles, the whole picture representing the early stages of what is known as altitude sickness. At greater heights this will become very much more marked, with grave effects on efficiency unless preventive measures are adopted.

These comprise the addition of oxygen, in varying degree according to height, to the air breathed at all altitudes of over 10,000 feet, coupled with attention to the fact that the earlier stages of anoxia are *not* appreciated by the individual himself and that it is essential for maximum efficiency to judge the oxygen need by the altimeter and not by symptons.

It may well prove of interest before proceeding further to study the foregoing chart which indicates graphically and simply the points I have mentioned and others. It is taken from Air Ministry Pamphlet No. 120 on the physiology of high altitude flying.

Turning now for a moment to the question of air sickness, this trouble is not a great problem as far as propelled aircraft are concerned. During flying training, with flights of two hours or more, about 17 per cent. of personnel are air sick on their first flight, 4 per cent. on their second, and 4.45 per cent. persistently suffer. At least 90 per cent. can be acclimatized by persistent flying. The incidence of air sickness is, however, much increased in gliders due to acceleration and the combined swing up and down motion of the glider when in tow, and it is not infrequent for some 50 per cent. or more of the men in a glider to be sick or severely incapacitated. Under such circumstances it is most important that any practicable preventive measures should be taken.

The psychological and physiological causes of air sickness are doubtful and the problem is one that has not yet been solved. Psychological factors definitely exert their effect, but are not normally the sole cause of true air sickness. Contributory causes, however, such as apprehension, cold, position in aircraft, alcohol, occupation, severe predisposition to nervous breakdown, and last but not least, anoxia may well play a material part.

Apart from routine steps directed towards eliminating contributory causes as far as is practicable, the best method of preventing air sickness so far devised is the use of hyoscine hydro-bromide tablets (which you will remember are also employed in the prevention of seasickness on landing craft and elsewhere).

With regard to the physiological effects of the drop, these are in the main due to the linear acceleration. According to the law of gravity a man falling out of an aeroplane acquires a constantly increasing velocity. However, since the space is filled with air the force of air resistance in a few seconds reaches the value of the force of gravity and he thereafter falls with an almost constant velocity. When the parachute opens after a constant falling velocity has been attained, the negative acceleration causes the parachute straps to exert a force of four to six times that of

gravity, and this may at times cause undesirable physiological and other effects. The rate of descent after the parachute opens depends on the weight of the pilot and the size and shape of the parachute. Most of these are designed to land the man at a speed of 16 to 20 feet per second, and the problems arising are, in a way, more anatomical than physiological, though damage incurred as a result of faulty landing may well have physiological effects.

The effects of pressure and anoxaemia are naturally not of very great moment in the ordinary operational parachute descent, which is done from a comparatively small height. With high level dropping, from 10 to 20,000 feet or more, the problems which will arise will clearly be of some considerable magnitude in view of the considerations previously mentioned.

You will realize that in the course of my remarks in relation to the Airborne Forces, I have trespassed somewhat in the field of the Royal Air Force and for this I must apologize. At the same time there is a small measure of justification for it, which I hope you will concede.

Time forbids of a consideration in any detail of many other problems which present themselves in modern warfare and which have gone unmentioned up to the present. The adverse effects of glare and dazzle will be known to many of you. Problems arise in relation to gunnery, and not the least is the occurrence of deafness in gunners. This problem of hearing difficulties raises its head also in connection with inter-communication in conditions of noise and din, whether gun fire, engines, or from other sources.

There are psychological and physiological aspects to the equipment provided to assist individual traction and land flotation. For instance the design of the boot is of the greatest importance, while such special items as snow shoes and skis produce problems of their own. Living and working conditions of the general and special type clearly bring with them many and varied human problems. Of special interest are the effects of environment, in service factories and workshops, on human health and efficiency, with the necessity for ensuring that it is adapted to the needs of the individual to the maximum possible extent. This problem is common to the Services and to industry in civil life and is the subject of much research and investigation at the present time.

Of a rather special and interesting nature are the problems which arise in regard to control rooms in the Navy and Air Force and their counterpart in the Army. Here the difficulties which arise are, in the main, due to fatigue in the individual carrying out work which involves the utmost concentration, speed of interpretation, and co-ordination of information obtained through the special senses, and finally the application of this information to the task in hand. The problem is to ensure that in this as in other spheres of activity the human machine provided for the task is as efficient as possible and thereafter to give that machine, in other words, the individual, such special equipment and environment as will reduce fatigue to a minimum.

CONCLUSION

I have in the short time at my disposal endeavoured to give some idea of the sources and nature of the biological problems arising in relation to modern warfare, and hope that in spite of the somewhat superficial handling of these, the importance of the subject will be appreciated by my listeners. There are certain points which I would like to stress in conclusion.

The first of these is in regard to the detection of problems. It is essential that they should be discovered, and this is not possible in entirety unless there is the fullest co-operation throughout, that is to say from the centre, including those engaged in the development of material, to the smallest units handling it at the periphery.

Secondly, and as a corollary to the first, is the need for the development of a keen interest throughout the Services in the biological aspect of man in relation to his clothing, equipment, weapons and vehicles and of these in relation to the man. It therefore appears to me to be a matter of extreme importance that in the training of all officers some special instruction, even though very limited, dealing with the subject under consideration should be included.

I would also emphasize once more that Service problems of the nature of those with which we have been dealing are basically similar to those confronting industry, as also the civilian way of life in general, and that much of what we achieve in their solution must be of value to the civilians and vice versa.

Finally a word about the science of social medicine, which is receiving much attention at the present time and which is comprised within the field of hygiene if the latter is properly defined.

Social Medicine is in the main the study of the man in relation to his environment and of the environment in relation to the man from the point of view of health and efficiency. Our personnel research in the Services is to a very material degree the counterpart of social medicine in civil life, and the Services cannot be said to be lagging behind in this vitally important study.

In conclusion we must bear it firmly in mind that research of this kind in the Services is essential not only to efficiency but also to health, and that while it is of paramount importance to the Services from the point of view of their efficiency as a fighting machine in war it is also of great moment to the well-being of the Service man in the piping times of peace.

ACKNOWLEDGMENTS

Much of what I have had to say in this lecture has been culled from reports, articles and official pamphlets published from time to time, and I wish to make a general acknowledgment of this.

In particular, as regards the problems arising in relation to Army fighting vehicles, I am much indebted to the researches of the Physiological Research Laboratory set up at Lulworth during the War by the Medical Research Council and to the various reports on the subject published by the Council.

Acknowledgments must also go to the Medical Research Council and its workers for reports on investigations in other fields, which have been of assistance to me, especially:

(1) "Effects on Man of High Temperatures," with special reference to the work of the Heat Physiology Team at the National Hospital, Queens Square, London, by W. S. S. Ladell (British Medical Bulletin, Vol. 5, No. 1, 1947).

(2) "Biological Assessment of Clothing for Tropical Service Use," by G. S. Weiner (British Medical Bulletin, Vol. 5, No. 1, 1947, M.A.C.).

(3) "Wartime Investigations into Sea and Air Sickness," by H. E. Holling (British Medical Bulletin, Vol. 5, No. 1, 1947, M.A.C.).

Full use has also been made of the Air Ministry Pamphlet No. 120 on the Physiology of High Altitude Flying.

Finally, I do not wish to go unmentioned the help that has been given me by Colonel T. F. Kennedy, O.B.E., Professor of Hygiene at the Royal Army Medical College, Millbank, and his staff, in connection with the production of the slides shown you; also in a general way by Captain I. K. R. McMillan, R.A.M.C., Secretary of the Military Personnel Research Committee.—LECTURER.

DISCUSSION

WING COMMANDER BEAUMAN: I was very interested in your remarks about arctic clothing and the inefficiency caused by this clothing. From the photographs, I can well understand that it would be so; I think it weighed 24 lbs.; but is such bulky clothing really necessary? A good deal has been learned in the last twenty years about clothing for high altitude mountaineering, where the problems are practically the same—very intense cold and very high winds, and there you certainly do not need such clothing; in fact, you could not wear it. There you have an over-all suit made of something like grenfell medium cloth, three or four light woollen waistcoats, fairly heavy vests and pants, two or three pairs of thick socks, worn in stout climbing boots, a helmet of some sort, and two pairs of gloves. I should not have thought that was nearly as bulky as the clothing you showed in your pictures and which you talked about.

THE LECTURER: I wish I were in a position to answer your question as efficiently as I would like. All I can say is that a great deal of work has been done on arctic clothing in Canada, as you probably know, as also in the U.S.A. and elsewhere. I know that in the Canadian work at all events the use of high altitude clothing of the type you mention was given the fullest consideration, but that it did not prove as satisfactory as the type of clothing which the slide depicted for you on the screen. The exact details of the reasons for which it did not prove suitable will have to be the subject of more detailed enquiries which I will make.

COLONEL F. H. SMITH: Regarding the matter of clothing, Russian women working outside in cold weather with the usual Russian top boots and perhaps a smock and a sheep-skin coat covering the loins underclothing, are often without protection to the knee, and they seem to stand the climate.

Our Highland troops, with no protection above the knee also stood up to cold weather better than some men with heavy tight-fitting clothing.

With regard to suggested acclimatization in 14 to 21 days for tropical climates, I found that by lifting the curtain of their bell tents to permit of feet exposure to sun for 20 minutes on the first day and 40 minutes up to the knee on the second day, and so on, acclimatization could be achieved rapidly and satisfactorily. The Germans effected the same procedure with artificial sunray lamps.

For mountain campaigns and the training of pack-mule columns, troops accustomed to riding "push-bikes" are far better than the men trained only on flat roads. The "push-bike" stationary on a stand with brakes gradually applied also gives further good results during training for hill operations.

THE LECTURER: There is a great deal of research still to be carried out on acclimatization to cold and it is doubtful at the moment as to the extent to which true acclimatization occurs. The subject is one which among others is being studied in Canada and the U.S.A. at the present time. I believe that in certain parts of the World where conditions of extreme cold are prevalent it is not unknown for native inhabitants to have acclimatized themselves to such an extent that they can stand up to the conditions with little else to protect them than oil rubbed into the skin.

LIEUT.-COLONEL STEWART BLACKER: The Lecturer touched on the subject of anoxia. I would like to ask him whether he does not consider that the various neuroses and psychoses which seem to affect the land soldier so much more than the seaman, and the Englishman so much more than the Canadian, Scot or Irishman, are mental in their origins. I suggest that a predominant percentage of the land intake nowadays comes from the downwind quarter of the large cities. In these the atmosphere contains a surprisingly large proportion of the carbon monoxide and other inert gases emitted by many hundreds of thousands of internal combustion engines. These gases sink to the lower levels, and drift down on the prevailing winds and thus contaminate the atmosphere breathed by their populations, who become mentally inefficient in consequence, and who are everywhere found in these portions of the cities. An astonishingly small percentage of cerebral anoxaemia appears to account for a serious degree of mental sub-normality.

THE CHAIRMAN

Some of you may not have realized the close co-operation in all scientific endeavours on the military side of medicine which takes place between the Royal Navy, the Army and the Royal Air Force. The experiments which are put into action through the deliberations of these scientific bodies, are considered in mutual discussion by three basic committees—the Royal Navy Personnel Research Committee, the corresponding Army Committee, and the Flying Personnel Research Committee. This exchange brings us in intimate contact not only with problems of the air but also problems of the land, such as the Canadian arctic clothing experiments, and so on. We are associated with our colleagues in the Army on the problems of airborne personnel. When we discuss the troubles affecting the middle ear at relatively low altitudes among airborne forces we find similar effects, but much accentuated in high-speed flight and diving from one altitude to another. Acute haemorrhages occur in the ear, and so on. Our problems of anoxia are accentuated in comparative degree. All these are met and remedied at the Institute of Aviation Medicine, Farnborough.

The Royal Navy, Army and ourselves come closely together in these highly scientific problems, and I think it is a perfectly true statement that neither a battleship nor a regiment nor a squadron of aircraft can hope to face a potential enemy, backed by advanced medical research, unless we ourselves are so equipped. It is becoming more and more a problem of medicine in its many branches, especially applied physiology.

Throughout all our studies, researches and deliberations we are intimately linked with the Executive of the three Services. I can speak in relation to the Royal Air Force, where our association with our executive colleagues could not be closer and more understanding. So medical science in relation to warfare is in truth an active problem, and it will never be allowed to die so long as it is necessary to defend this country.

I thank the Lecturer very much indeed on your behalf for an excellent résumé of highly important problems studied at the present time. (*Applause.*)

AIR CHIEF MARSHAL SIR JOHN SLESSOR: I was hoping the Chairman would say what he did say about the close co-operation between the three Services in this matter, because, in listening to Brigadier Richmond's interesting lecture, it must have struck any member of either of the other two Services how many of the problems he was dealing with in the Army are common to us, too, in the R.A.F. and in the Navy.

No one has done more in the R.A.F. for flying personnel research than our Chairman, and I would like to extend on your behalf our thanks to him for coming and taking the Chair this afternoon. (*Applause.*)

(In connection with this lecture, attention is invited to the article on "Physiological Aspects of High Speed Flying" in the Journal for February 1948, *and the lecture on "Exercise 'Musk Ox'" in the Journal for November* 1947.—*Editor.*

THE TERRITORIAL ARMY

By MAJOR-GENERAL G. W. E. J. ERSKINE, C.B., D.S.O.

On Wednesday, 3rd November, 1948

GENERAL SIR WALTER M. ST. G. KIRKE, G.C.B., C.M.G., D.S.O. in the Chair.

THE CHAIRMAN: Those of you who knew General Erskine before the War as G.S.O.2 of the London Division will not have been surprised at his rapid rise. After leaving the London Division he commanded a battalion and then a brigade, which he took out to the 8th Army. He was B.G.S. XIIIth Corps at Alamein, and later acting C.G.S., 8th Army.

He commanded the famous 7th Armoured Division in the final operations in Tunis, and took it to Sicily, Salerno and right up through Italy. He then brought the Division home and took it to Normandy on D-day. Later he was appointed General Eisenhower's representative in Belgium and head of S.H.A.E.F. Mission, commanded an infantry division in Germany, then went out to command at Hongkong, and here he is this afternoon as head of the Territorial Army to tell us something about it.

The Territorial Army cannot complain that their Director is wanting in military experience.

LECTURE

THE fact that we have one National Army containing a Regular, a Territorial and a National Service element has been explained many times in recent months. But the full implication of this change in the shape and composition of our Land Forces has not yet been fully appreciated even in military circles. It is my task this afternoon to try and explain the changes which have occurred in the organization and role of the Territorial Army and in its integration with the other elements of the National Army.

We have learned from bitter experience that when war comes it is then too late to commence the training and equipment of our land forces—such forces as the Government decide are necessary must be ready, organized and trained to take the field. The great speed with which the opening phases of a war can be developed by an aggressor make a high degree of readiness on our part an essential condition.

The General Staff have advised that the forces we require for war should be based on the Territorial Army. This means that the Territorial Army Order of Battle will have to be deployed at once in case of an emergency. It follows that this Army must be supplied, and kept supplied, with trained men. Its equipment must be the best we can provide. It must be capable of being brought to a full state of mobilization very rapidly. It must be a balanced army containing the right proportion of all arms and administrative services.

This requirement implies a change from the purely voluntary status of the Territorial Army to the acceptance of an annual intake of National Service men who have been thoroughly trained before they join the Territorial Army.

The role of the Regular Army has now become :—

(*a*) The provision of overseas garrisons together with small mobile Regular reserves to meet peace time emergencies.

(*b*) The training of the National Service man during his 12 months continuous service.

(*c*) Regular assistance to the Territorial Army.

The task of assisting the Territorial Army includes the provision of individual Regular officers and men in the establishment of T.A. units. It includes the command

and staff arrangements on a Regular basis above the unit level. It is also the intention to provide for some Regular units in the T.A. Order of Battle when the commitments of the Regular Army make this possible.

Let nobody underestimate the heavy tasks which fall to the Regular Army whose time is to be given unsparingly to training the National Service man for the Territorial Army and in assisting the Territorial Army all the year round.

It is not my object to spend much time in justifying the General Staff advice that the new National Army should be based on a Territorial rather than a Regular Order of Battle.

There are those who would like to have seen a system of National Service direct to the Territorial Army but without any previous training. This would have produced an untrained or undertrained body of men which could not possibly have been regarded as in a state of readiness to take the field and handle modern equipment on the outbreak of war.

There are those who would like to have seen the Regular Army both train the National Service man and also handle his reserve training. This would have required a very considerable increase in the size and cost of the Regular Army. Such a scheme would have been highly extravagant and wasteful in Regular cadres. It could have produced reserves of trained men but, unless the Regular Army was recast on a very much larger scale, there could have been no units into which to absorb these reserves on mobilization. Such a system would incidentally have destroyed the Territorial Army completely because there would have been no field of recruitment left for it. This again would have deprived us of the valuable services of the voluntary part-time officer and man who have always been such a valuable asset for war-time expansion.

There are those who would have left both the Regular and Territorial Army on a purely voluntary basis. This could not have produced the minimum forces we need in a state of readiness in an emergency.

The decision by the Government in 1947 to introduce the National Service Act and to base the future Army on the lines I have described is a bold and far-reaching reform which is capable of giving us a very fine first line of defence without excessive cost or undue interference with the economic and social life of the country. Moreover, and this is important, I believe it will suit the British temperament, which likes to identify its soldiers as citizens and is rightly proud and jealous of the territorial ties and traditions of its Army.

It is of course for Parliament to decide the standard of readiness which it requires of its Armed Forces. Provided we do not depart from the principle of National Service, the present Army organization is capable of reflecting the degree of readiness required by Parliament without any major changes in the organization of the Army. A higher degree of readiness and efficiency can always be obtained within the present framework by lengthening either the full-time or part-time Service of the National Service man or by raising the Regular Army manpower ceiling.

I must now describe how the arrangements are to work.

It will make it easier if I define at once the liabilities of the National Service man and the volunteer.

The National Service man is liable to one year's continuous service and six years on the reserve, during which time he is liable to 60 days training with not more than 21 days in any year. He will do his year's continuous service with the Regular Army,

and for his reserve service he will be posted to a unit of Territorial Army of the arm in which he has been trained, near the place of his work or residence.

In exceptional cases, owing to a change of home address or other personal reason, there may not be a unit of the arm in which the National Service man has been trained near his home address. He may then have to go to a unit of a different arm and some re-training for his new arm would have to be undertaken.

Certain technicians and specialists may be posted to Supplementary Reserve units rather than to the Territorial Army.

The normal arrangements for the use of the 60 days will be that each year during the first five of his six years on the reserve he will be required to do 12 days training. During his sixth year he will not be called up for training if he has completed his full 60 days in the previous five years. The 12 days training liability would take the form of eight days in camp and four other days. The four other days might be two week-ends of two days each, or compounded in the form of four evening training periods at the drill hall to a day's training.

The National Service man gets his Army pay during training and certain expense and travelling allowances. By law an employer must give him leave to attend military training but he is not bound to give him his civilian pay. The employer cannot dismiss a man because of his military training obligation. The National Service man is entitled to no bounty for carrying out his statutory obligation.

The National Service man can elect at any time to become a volunteer. If he does so, I hope he will be given every benefit and opportunity open to the volunteer so that there shall be absolutely no difference between him and the pre-war volunteer except that the National Service man has had the great advantage of a full year's training in the Regular Army.

The volunteer enlists for a specified number of years, usually four, and he is eligible to re-enlist within certain conditions of age and medical fitness. The volunteer, including the National Service man who elects to become one, then renders himself liable for 15 days training per annum plus 30 hours additional training periods. An evening training period (a " drill ") consists of a minimum of two hours training. The volunteer gets a bounty of £4 for going to camp plus £5 for completing his annual training obligations including camp, i.e., £9. In addition he can earn an extra £3 bounty by putting in thirty extra hours in training periods (30s.) and reaching a satisfactory efficiency standard (30s.).

The volunteer is not compelled to go to camp for 15 days, but he must do at least eight days camp—the remainder may be in camp, at week-end training, or in the form of evening training periods at his drill hall. If the volunteer falls short of his training obligation he would forfeit his bounty or part of it.

To summarize, therefore, the National Service man does 12 days a year and need have very little contact with his unit except in camp. The volunteer undertakes 15 days training and a minimum of thirty hours additional training periods. A further thirty hours training qualify for the extra 30s. bounty and there is no maximum except the capacity of the training grant to pay his expenses and allowances. The volunteer, even with the National Service Act, or more correctly assisted by that Act, must always remain the mainspring of life and enthusiasm of the unit.

The Territorial Army Order of Battle has been drawn up to provide the balance of arms and administrative services required by the General Staff.

The Order of Battle includes six Infantry Divisions, two Armoured Divisions, one Airborne Division, a number of Independent Infantry and Armoured Brigades and Anti-Aircraft Groups for the A.A. Command. In addition, there is a substantial backing of Army Group units of Royal Artillery and Royal Engineers, Signal, Ordnance, R.A.M.C., R.A.S.C., R.E.M.E. Units of every type required in a modern army are included to complete the Order of Battle.

These units actually exist, and recruiting opened for them last year on a voluntary basis. We have appealed, and are still appealing, to experienced ex-Service officers and men to join. These volunteers are the foundations on which we must build this Territorial Army. The measure of success in this phase is the strength and quality of these voluntarily recruited cadres. It is from these cadres that we expect to get the command and leadership element of each unit. It is a very important phase. With these cadres in existence we can go ahead and build on firm foundations.

We have made our target for the cadre 25 per cent. This is perhaps generous because many people have had to form units on a much smaller cadre than that. But the important requirement is the quality. Experienced officers and N.C.O.s imbued with the right spirit, even in quite small numbers, will not find the task of creating units from trained men too difficult.

The National Service Act of 1947 does not bear fruit so far as the Territorial Army is concerned until 1950. Next year, 1949, the first intake under this Act reach the Regular Army and do their 12 months continuous training. It is therefore not until 1950 that they reach the Territorial Army. By then the cadres should be well formed and ready to receive these men. It is a fairly slow process, and from 1950 it will take us about five years to fill our establishment. This does not however mean that we have no Army during those five years. So long as we have the cadres which we are recruiting now, we can always fill up the units in an emergency from trained men who have left the Colours under the 1939 Act.

There are over three million trained men in the country at present. If an emergency arose, the problem is one of organizing the return of these men to the Colours smoothly and without dislocation of industry. Naturally it would have to be a serious emergency to justify such measures but I want to dispose of the criticism that our present plans produce nothing for five years.

You will have noticed a recent decision to register reserves on a voluntary basis for Anti-Aircraft Command for men with A.A. experience.

We must get accustomed to the fact that we will not find the Army which is going to war stationed at Aldershot, Tidworth, Colchester and the other well known military stations. Most of these barracks will be occupied by training establishments training the National Service man. The Territorial Army which is to be ready to take the field will be dispersed all over the country. There will be few towns in England which are not able to boast of some unit in this Army.

Let us look at this Territorial Army as it will be in a few years time and see what we expect to find in a typical unit.

The unit should be strong in officers. Most of them will be Territorial officers with war experience. There will be a Regular Adjutant and a Regular Quartermaster. There might be a Regular Commanding Officer if a suitable T.A. officer has not been forthcoming. If there is a T.A. Commanding Officer I hope we shall be able to provide him with a Regular field officer to help with the training of the unit. Among the younger officers there will be some who have recently completed their year with the Regular Army and been trained and commissioned as officers.

The warrant officers and sergeants, like the officers, will probably contain a good many old hands. Most of them will be war experienced N.C.O's who may have served in the unit for some time or responded to our appeal in 1947 and 1948 to come back and give the unit a good start. There will be some Regular Army Permanent Staff Instructors. I cannot say quite how many, but I hope four or five—they are posted for about two years and are part of the establishment and not on loan as they were before the last war. There will be some young N.C.O's serving in the ranks without war experience. These will be men the Commanding Officer has picked out from the rank and file for promotion. They may be men who have joined the unit as Volunteers or they may be National Service men who have been posted to the unit. I hope very much some of them will be National Service men who, after being posted to the unit, have turned themselves into volunteers and been picked out by the Commanding Officer for their keenness and efficiency. A wise Commanding Officer will be on the look-out for the best of the National Service men and waste no time in encouraging him to become a volunteer and go in for promotion. In time to come the National Service man will be the Commanding Officer's main source for recruiting volunteers. It will seldom be a question of recruiting an untrained civilian to become a volunteer but of persuading a National Service man to change from one form of service to another. The Commanding Officer will be anxious to get his best men to put in longer hours and perhaps stay on with the unit when their National Service obligation expires.

Among the rank and file we shall find the same kind of people but in a rather different proportion. There will be a number of the old hands who volunteered, i.e., pre-war Territorials or men over 20 who have done their service under the 1939 Act or are deferred because they are miners or agricultural workers. There may be some men who have joined as volunteers before being called up—in particular ex-cadets. Such men can serve before call-up and I hope they will get a credit for doing so against their liability after call-up.

Then there will be the National Service man who has done his year. These will be divided into those who have turned themselves into volunteers and those who have not. Each month from 1950 the proportion of National Service men in the ranks of the Territorial Army will increase at something like 8,000 a month. Every inducement will be held out to the best of these men to turn over to volunteering. There are two very good reasons for this. In the first place we want them, particularly the future N.C.O's amongst them, to put in the extra time required of the volunteer in order to qualify themselves for the responsibilities of leadership or specialist duties. Secondly we want to maintain a strong unit *esprit-de-corps* based on enthusiastic volunteers who are prepared to set quite a new standard of military efficiency.

Military efficiency requires discipline. One of the problems which will face every Commanding Officer is how to obtain a high standard of discipline in a unit composed of Regular, volunteer and National Service men under peace-time conditions. It is quite certain that we must establish a discipline which will hold the unit together in the test of war. In the old days many Territorial units were able to establish a discipline based on the *esprit-de-corps* of their unit. But there were others, and I think we must admit it, where discipline was slack. The system, or lack of system, did not stand up to the strain of rapid expansion and duplication of units. Regular officers and Regular staffs were too ready to accept a different standard. It was only too common to find orders regarded as suggestions and as a basis for discussion and

arguments. The importance of unit administration was often missed, and in the early days of mobilization many units suffered unnecessarily because of ignorance of these matters. Whatever else the T.A. Centre may become, it must primarily be a military place where things are done in a military fashion and where the standard of conduct is in the proper tradition of the British Army. Parades must be parades, properly organized, properly supervised. When you go to a T.A. Centre on a drill night you should feel you are walking into a military atmosphere. I do not propose to go further into this matter now, but I commend the study of this problem to every Commanding Officer.

We shall also find in the Territorial Army some A.T.S. They of course are not subject to the National Service Act and their recruitment is purely voluntary. They are being organized to do the task which they did so well during the War. Some of them will be in mixed A.A. units where their quickness and skill with the radar and other instruments will be of the greatest use; others will be organized in general duty companies to provide clerks, telephone operators, drivers and general administration duties.

I can hardly mention the Territorial Army without mentioning the Cadets, i.e., the Army Cadet Force and the Combined Cadet Force. Neither of them are part of the Armed Forces but both of them are very closely connected with the Army. Both of these organizations provide pre-Service training in which the Regular Army assists. From these we get most valuable officer and N.C.O. material. Their pre-Service training is recognized when they join, and it enables us to pick out without delay the best material for leadership training. The Combined Cadet Force is based on the School, and the School is therefore its home. The Army Cadet Force have school and "open" units. In the case of the former, their home is their "hut." In the case of the A.C.F. "open" units, a Territorial Army unit undertakes to assist them and share some of the facilities in their drill halls. Much more could be said about the Cadets, but I have not got time. I must leave them with the remark that they deserve the very strongest encouragement and help.

You will want to know how the Territorial Army is administered and accommodated.

The home of the unit is the Drill Hall. In more genteel circles it is called the "T.A. Centre." There may be one if the unit is concentrated, or several if it is scattered in battery/squadron/company detachments. The drill hall is intended to provide both training facilities and social amenities. You should therefore find covered space for training, including facilities when required for gun drill, tank drill, miniature range, technical training, lecture rooms, tactical model room. Close at hand there should be garages for training vehicles. As part of the building or close at hand there should be offices for the C.O., Adjutant and Quartermaster and a clothing and arms and equipment store. These, broadly, are the military requirements of a drill hall. The social amenities should include an officers' mess, a sergeants' mess, canteen and recreation rooms. There is a scale for all these things and during the last few years before the War we built many good modern drill halls.

At present there are many drill halls which are below standard and not suitable for the type of unit in occupation. There are a good many cases where units have to share—in fact, there has got to be a very considerable building programme. This is bound to take some years to complete. It would be misleading to suppose that marble halls are suddenly going to appear. We shall do our best to provide good accommodation and some amenities in which the unit can develop a social life of its

own. In some cases we can allot Regular barracks, in some cases we can buy and convert, in other cases we can adapt and extend existing accommodation. In many cases we can only buy the land and put up temporary huts—and of course there are cases where procuring suitable sites is most difficult. Until the general housing conditions in the country are better we are not building drill halls in permanent construction. We are, however, building houses for the permanent staff, including the Regular officer staff, and I hope it will not be long before we can start on our permanent construction programme for drill halls.

We have never before had a Territorial Army of anything like the size which we shall have, under the National Service Act, by 1955. It will be necessary to review the scale and standard of accommodation. Our 600,000 men will be the pick of the manhood of the country and the T.A. Centre must be a place of which the unit is proud. Dingy buildings in back streets are not acceptable. I doubt if even the best buildings we have to-day are good enough—I do not think the club life of these men will be satisfied with beer, whist drives and dancing. I would like to see more opportunities for the manly sports and games which the Britisher loves but at which he so often has to be a spectator because of the lack of opportunities—young men will want to box, play football and improve their skill in the gymnasium and at track events. They will, we hope, have had a taste of these things during their year with the Regular Army. It is not so many years ago that the Regular soldier's place of recreation was the public house, and sports facilities were an unknown luxury. It is my belief that the T.A. Centre of the future will have to pay much more attention to providing natural and healthy pursuits for the young man.

The peace-time administration of the Territorial Army is carried out by County Territorial Associations on behalf of the War Office. It is these Associations who initiate and carry out the building programmes and maintain the buildings when they are complete. They also furnish the building, provide heat, light, and add amenities. The Associations also act as retailers for the equipment and clothing provided by the Army in bulk. Units account to Associations for the equipment and clothing in their charge. Recruiting and publicity is another function carried out by Associations, and it is being vigorously carried out to-day on behalf of our present recruiting drive. Some of the functions of T.A. Associations have changed and others have an increased importance. For instance, commissioning and appointing officers is no longer a function because of the O.C.T.U. system ; on the other hand accommodation is a bigger job than ever, and with it go the social amenities and welfare which we hope to see on a much improved scale. As this is not a treatise on Associations, I hope I may leave it at that and thank them for the very real help they give to the Territorial Army. It is all voluntary and takes up a tremendous amount of the valuable time of very many busy and public-spirited people throughout the length and breadth of the country.

In conclusion, I should like to say there is nothing unusual in Regulars, Volunteers and National Service men serving alongside in the same unit. They did so during the War with complete success and they will be able to do so again. Undoubtedly it requires an intelligent and broad-minded Commanding Officer who will stand no nonsense from vested interest or people who are " private army minded." Nothing must stand in his way in welding the unit together.

There is an unreasonable fear that the old Volunteer will not like the National Service man or that the National Service man will not like the Volunteer—I believe

this is an unjustified and prejudiced view. I am certain the old Volunteer will welcome the National Service man who elects to become a Volunteer and both will recognize and respect the fact that some National Service men cannot take on the extra obligation.

Units will be encouraged to foster their territorial and local traditions. They will be proud of themselves, and their city and county will be proud of them. In everything to do with the military efficiency of the unit the War Office discharges its responsibility through the Commanders-in-Chief of the Commands in the United Kingdom. This places on them and their subordinate formation commanders the responsibility for putting into effect this bold but essential Army reform. We must never allow any consideration to obscure the object of this reform, which is to provide a highly efficient force with which to defend our country and the ideals for which we stand.

DISCUSSION

GENERAL SIR HENRY AP RHYS PRYCE : We are all very anxious to carry out recruiting for the Territorial Army well, but to do so we must have accommodation, equipment and training. Accommodation is a matter of extreme urgency. I looked up what the accommodation is going to cost for the Territorial Army, and it worked out at about £50 million, and last year we provided £1,055,000, and this year £2,460,000, so if we do not get more than that two-and-a-half million a year, we shall not complete the £50 million programme until 1968. The Secretary of State has said the Territorial Army will be at full strength in 1954, so the accommodation will be fourteen years in arrears. We therefore need £10 million a year to get the accommodation ready in time. The Secretary of State has said that he cannot afford £10 million a year, simply because the labour and materials are not available. Housing accommodation for the permanent staff and key members of a unit could easily be provided if we follow the example of business firms and buy large houses and turn them into flats.

If anybody says that the Territorial Army is getting too large a share, we can quote the Minister of Defence, who said " The Services will get a fair share of the present housing development." In this connection, there is one point I would like to ask, and that is about the marriage allowance for the Regular Army. I see the officer can only get it at twenty-five and the other ranks at twenty-one years, and there are 16,000 married quarters to build because of that. Cannot the other ranks be also raised to twenty-five years of age for a marriage allowance, so that there may be some money available for the Territorials ? There are over a hundred drill halls deficient.

As regards equipment, it is an axiom that without arms and equipment we are not efficient, and it seems extraordinary to think that three years ago we had a large Army with adequate up-to-date equipment, and now the Ministry of Defence has said the stocks are depleted, and the Secretary of State actually said on 9th March : " It is very dangerous to encourage men to come in now in face of the lack of accommodation and equipment."

I know in my own unit it has been rather a shock to think that just three years ago it had its sixteen guns and adequate subsidiary equipment, yet when it was reformed after " suspended animation " it had one gun and it took eight months to get the subsidiary equipment for it. It took seven years to get munition factories built and into production. Many have been demobilized and we ought to retain stocks of equipment to cover the period until they can get into production again. As it is, the Minister of Defence has had to stop sales of so-called surplus stores in order to make good deficiencies. Last year we were allowed £36 million for equipment and £14 million of that were not spent. This year we are allowed £30 million of which £13 million is being spent on the maintenance of old vehicles. That only leaves £17 million ; deducting the £14 million that ought to have been spent last year, we really only get £3 million for new stores this

year. As the Secretary of State said: "Should war occur no breathing-space will be available. The shock will be sharp and sudden"; and as far as one can see we really want, instead of this £30 million, £50 million a year and to see shadow factories put into operation. This equipment has to be maintained and R.E.M.E., which is responsible, is only 8 per cent. of authorized strength, and is unlikely to be at full strength until tradesmen's rates of pay are re-introduced.

Then as regards training: anti-aircraft sleeve targets are only flown at about 150 miles an hour, and we shall have to shoot aircraft flying up to 600 miles an hour.

I trust that as the Government have appealed to us to be patriotic and join the Territorials they will be patriotic also and put down the full amount required for the equipment and the accommodation that will enable us to be efficient, and that means about £10 millions for the accommodation and £50 millions for the equipment. As Winston Churchill said: "Give us the tools and we will do the job" and recruiting for the Territorials will go with a swing.

THE LECTURER: On the subject of accommodation, it is not quite as bad a picture as you painted. We are going in for buying land and buying extra space to put up houses and improve T.A. Centres. I do not accept the figures you have given because I expect you took them out of some vote, but much more has been spent than that on providing accommodation. I am not going to say that the accommodation position to-day is at all satisfactory, but I will say this: the Quarter-Master General is stretching everything he can to provide what is required; for instance, 600 houses for permanent staff have been ordered to be built this year.

On the subject of drill halls and T.A. Centres I will repeat what I said. We are gradually meeting it by this means: allotting regular accommodation, buying places and adapting them, taking places that exist and expanding them. I will admit that there are something over one hundred units or sub-units which have not got any accommodation at all and 300 more are sharing. In cases where we are building afresh we are only building temporary accommodation. All I can say is that the final picture of the Territorial Army accommodation does not have to be ready on January 1st, 1950, because at that time our strength will only be 25 per cent. plus the 1950 intake, so we have a little longer than you indicate. I am not complacent about the matter of accommodation, but we are getting on with it at the War Office; it is not a shortage of money that is delaying progress; the difficulties have been in sorting out complicated problems to do with town and country planning and local authorities and things of that kind. It is being done, and it will be my earnest endeavour to see that more is done.

On the subject of equipment it would also be a wrong impression that equipment of all kinds is short. I think, however, that you said anti-aircraft equipment was the matter that was troubling you—radar equipment. Am I correct?

GENERAL SIR HENRY AP RHYS PRYCE: Both radar and the guns and the accessories for the guns.

THE LECTURER: Generally speaking, there is no shortage of guns. There is a shortage of radar equipment—not so much the equipment is short but skilled people to put that equipment in order and have it in workable condition have been employed since the War on doing other things and only recently have they been turned back in sufficient numbers to get the radar position better. We know there is a shortage of specific articles of radar equipment, but every unit has, I am told, enough to do its training for the number in the unit at the present time. Another consideration concerning equipment is the question of who is to look after it. The Territorial soldier cannot really look after the equipment. He comes along and expects to find it ready to use for his drill. The permanent staff instructors are busy instructing, and we have not really got the right people for that. That is a matter I know will be corrected but it is no use dishing out

equipment and letting it rust and rot. We must ensure that there are garages and proper places to put it in and also people who can keep it in order and see that it is properly looked after.

LIEUT.-COLONEL F. G. POOLE: Does the Lecturer think that our Territorial Army recruiting would be improved if the Government announced that the National Service term would be eighteen months instead of a year?

THE LECTURER: I would rather doubt whether an announcement about the National Service continuous service would have a direct effect on recruiting. It would certainly have effect upon the National Army of to-day because the position to-day is that unless the service with the Regular Army is increased we are going to be in considerable difficulties during 1949 because there is going to be such a very quick run out. A man coming in on 1st January, 1949, is expecting to get out by the following December, and that is going to reduce the whole size of the Regular Army very severely. Your proposition will have an effect on the Regular Army and the Regular Army's role that it has got to carry out. But I do not particularly see why it should affect recruiting.

BRIGADIER G. W. SUTTON: May I ask what is going to be the system of posting the Regular personnel to T.A. units? As a former Territorial I heartily agree with your remarks about many Regular officers having treated us much too kindly and about the need for a military atmosphere. I think that unless posting is watched there will be a danger of either going back to that or to the other extreme. Because they have less time to train, the Territorials need the best and not the second-best instructors and I do not think that the onus of parting voluntarily with his best men should be laid on the Commanding Officer of the Regular unit.

THE LECTURER: I would first like to say that it is very definitely the policy to give the Territorial Army the very best we can find in the way of officers and permanent staff instructors.

Next the question of their duty. That is always a difficult matter because you have to balance sending a man to the Territorial Army for these duties for too short a time against taking him away from his Regular unit too long and possibly allowing him to get out of date.

The tour of duty for Commanding Officers, Regular officers doing Commanding Officer duties, and Adjutants is two years extensible to three, and in the case of Quartermasters and permanent staff instructors it is two years extensible to two-and-a-half years. There would be consideration for special cases, of course. Perhaps this is a little bit on the short side, i.e., one would like to see it a little longer. But I know the difficulties of the Adjutant-General at the War Office in giving them longer, because of the need for so many Regular officers overseas and the unfairness of some being at home too long.

I am very glad you agree that there should be a military atmosphere and not an "old boy" atmosphere in the drill hall.

BRIGADIER B. CHICHESTER COOKE: The Lecturer mentioned a major point that I think is very important in this matter of the National Service man opting to volunteer for the Territorial Army. Could he tell us whether one can gather from his remarks that there is to be or already is an amendment to the Act which permits the soldier to do that at any other time than his twelve months with the Colours, when he has never seen the Territorial Army, because that is how the Act was passed through Parliament. I do not know whether it is amended.

Secondly, I would like to make a point on equipment because we are getting rather two sides to our picture here: one is the Lecturer's viewpoint, and the other that put by General Rhys Pryce—the user's point of view on the ground. I do not believe it is true there is a shortage of equipment in all directions, but I do believe there is a shortage of elasticity in the organization by which it is provided. I have an instance as a serving formation commander of a unit—a small one, under my command which has

been formed since May, 1947, and has not yet any equipment whatsoever. The strangest part of it is that being an operations room the only equipment required is three kitchen tables and six ordinary field telephones; but no power on Earth has been able to produce those telephones other than by buying them from Gamages out of the training grant. That is the way the thing is working at the bottom end, and I don't believe that is the intention of the War Office or anybody else. But I do believe somewhere in the chain there are some gentlemen who could very well be stirred up in a lot of these matters.

THE LECTURER: If I may take the last point first, I will willingly look into the difficulties you mention if I may be given the details.

On the first point, you are quite correct that the Act as it stands gives the National Service man the right to volunteer during the full-time National Service period and not afterwards. Under the statutory regulations that are being drawn up, if they are approved, he will be able to volunteer at any time during his reserve service.

COLONEL G. R. CODRINGTON: We have been told how the Regular Army now looks on the Territorials as being integrated with them in one National Army. I do hope that that doctrine will percolate right down the hierarchy. I recently received a M.S. letter, which dealt with travelling warrants and petrol for honorary Colonels to visit their units in their districts, but it was expressly added that the concession did not apply to the Territorial Army. The particular point is in process of being corrected, and therefore does not arise, but the mistake has been made, and it has been described to me as a gratuitous and unnecessary insult. The gentleman who issued that letter wants to be taught that there is one Army only.

THE LECTURER: As far as is within my power I will make it clearly understood wherever I go that it is one Army and one Army only.

THE SECRETARY (CAPTAIN E. ALTHAM, R.N.): We have heard on several occasions about the importance of developing the closest association between the Territorial Army and the Regular Army. Here, at the Institution, we are trying hard to help Regimental Museums all over the Country to get going again and develop after the War, and I am wondering whether more could be done to bring the Territorial interest and the regimental interest together through that medium. In some cases I think the Regimental Museums do embrace their Territorial confrères in some way; but in others they do not appear to do so.

I do, however, put forward the idea for what it is worth.

CAPTAIN A. E. C. GREEN (Honourable Artillery Company): The Lecturer referred to the necessity for producing a balanced force and stressed the necessity for having a proper proportion of all arms in the Territorial Army. I did hope that he would have gone on to refer to some possible scheme for training the Territorial staff officer. He did touch on our weaknesses at the beginning of the War on the staff and administrative side of the Army as a whole. Millions of pounds of public money were wasted. Millions of man-hours were wasted, and the loss of efficiency was incalculable as a result of the ignorance of Territorials and war-time volunteers in all matters relating to staff and administrative duties. Thousands of Territorials became staff officers in some capacity or another without previous training, but those experienced men are to a very great extent going to seed at the moment, and I do hope that the Director will be able to tell us of some scheme that is going to be put into operation in the very near future. I can count thirty or forty friends of mine who were staff officers during the War who would come back into the Territorial Army to-morrow and train to bring themselves up to date in staff duties.

Secondly, in the unit to which I belong a very large proportion of those who have enlisted in the ranks held Commissions during the War. They have therefore resigned

Territorial or Emergency Commissions to assist in re-forming the Territorial Army, and I would urge that their position be clarified. A definite guarantee should be given to these experienced volunteers that in the event of another emergency they will be under no disability as compared with those who have not seen fit to come forward and who will soon probably be in large numbers on the recently formed nominal reserves.

Without wishing to bring anything of a political nature into this discussion, I would just wish to refer to a matter which you mentioned, and that is the hope which has been expressed by the military authorities and by the Government that employers will offer facilities to their employees to join the Territorial Army. These facilities include, of course, not only the additional time for camp but also the very important factor of pay during that extra period of leave. I have recently been in correspondence with every branch of nationalized industry—railways, London Transport, the electricity authority, and so on. In every case in reply to my enquiry whether we could approach their staffs at some organized function, or whether they would give out a directive that their staffs would be granted not only time off for camp but also pay for that time, I either had a negative or a non-committal reply. Both the Secretary of State for War and the late C.I.G.S., in recent speeches, expressed the hope that nationalized industries would encourage recruiting and give a lead in this matter.

I would like to know whether any pressure is being brought to bear on the State industries to come into line with the private firms and concerns who are to-day, as in the past, loyally supporting the Government and encouraging the Voluntary Forces in their difficult task.

THE LECTURER: On the subject of keeping people up to date with their staff duties and their staff training, I think the scheme will work like this. There will be a correspondence course followed by a short, probably ten-day, course at one of the military colleges, possibly based on camp. The output cannot be very large—something, perhaps, in the region of fifty or sixty a year—probably two courses from Midsummer to Winter and Winter to Midsummer, preceded by correspondence courses supervised by adequate and up to date military staff. Those are the lines on which we are working. Of course, there is a very large number of officers with staff experience, and we are anxious to keep them up to date if they are willing to give us the time and keep themselves up to date. I entirely agree with your point, and I think very shortly—and I mean by very shortly a matter of a month or two—definite announcements will be made. A definite scheme will be launched to cover this important point.

The next question is that of the officer going back to the ranks. I am well aware of that. I am not in a position to make any announcement about it, but only to say that I see all the points that you make.

Then there is the question of the employers in the nationalized industries. It is a known fact that the nationalized industries are all of them taking a different line. They are not all encouraging the Territorial Army. Airways Corporations, as a matter of fact, do. The electricity undertakings do what their respective private electricity undertakings did before they were collected together, and that is different in different places. I think we are on very good ground in asking the employer to give a man leave to go to camp. After all, when a National Service man comes along he has a statutory right to be given leave to attend training. When it comes to the question of pay I think it is proper to put it like this: what does the man get in cash if the employer does not pay him? Take a one star soldier who is married. He gets for an eight-day camp £2 pay. He gets £2 marriage allowance. He also gets £4 camp bounty. He gets a total of £8. I am not bringing into that the £5 which is due to him for general services or the 30s. for the extra drills which he does, or the 30s. for efficiency. How many employers pay their men more than £8? If he goes to camp for fifteen days, he is not so favourably treated, because he

gets only the same amount of bounty as for eight days, and in fact, roughly speaking, instead of £1 a day he is down to about 15s. a day. That is the position, and my feeling is that if the man goes to camp for eight days and his employer allows him to have leave but does not give him pay he is not going to be much out of pocket.

THE CHAIRMAN

I should like to make it clear that I have no connection with the War Office, and that what I am going to say is entirely my own opinion. The outstanding feature of the scheme outlined by General Erskine is the fundamental change in the composition of the Field Army, only made possible by the fact that all future entrants into the T.A. will be trained soldiers instead of raw recruits, and so the plan entirely depends on the continuance of conscription. The scheme has its critics of course, but what are the alternatives ?

Some people say " increase the strength of the volunteer Regular Army and never mind the expense." Those who think on those lines can never have had anything to do with recruiting, or they would know that our recruitable potential is strictly limited in peace-time and cannot be exceeded, any more than you can force the speed of a ship beyond a certain point, however much fuel you burn.

Another alternative is to do what other nations have done in the past, and what Russia is doing now, and that is to have a longer period of compulsory service. Our present one year has the worst of both worlds : it effectively interrupts the streamline of a youth's career, and turns the Regular Army into a gigantic kindergarten. It may be excellent moral and physical training for our youth, but it does not give us an army fit to fight at short notice, because as soon as a man is trained, he passes out.

The military advantages of a longer period are incontestable, but there is of course another point of view, that of economic recovery which it is one of the Cominform's main objects to interrupt.

It is a question of balancing risks, and that is above our heads, but from what General Erskine has told us it would seem that this new scheme will give us a useful weapon. Moreover, its cutting edge can be sharpened at any time by increasing the period of compulsory service, or adding Regulars at present overseas.

General Erskine has explained that if we have to mobilize before the T.A. is complete with National Service men, it will be made up from the three million ex-soldiers now in the Country. The efficiency of the resulting amalgam will obviously depend mainly on the framework, that is to say on the quality of the 25 per cent. cadre which is now being invited to join the T.A.

It is not proving an easy job to get this 25 per cent. and the reasons are not far to seek. For one thing, General Erskine has not got the powerful assistance of Hitler. The Moscow gang are every bit as dangerous but they are far more subtle, and Russia on the map looks to the man in the street much further off than, militarily, it really is.

Of the young men, those not in reserved occupations who might enlist are booked for National Service. The older men who fought in the War are for the most part engaged in reconstructing their civilian lives or raising families, or both. Generally speaking, wives are disinclined to encourage their husbands to join. True the duties are not onerous. One night a week at the T.A. Centre hardly makes a " T.A. widow " or gives grounds for a judicial separation, but at the back of their minds is the fear that their husbands may be opening batsmen in the second innings on the usual sticky wicket.

There remains the middle lot ; the men between 22 and 26. General Erskine, is I believe, quite right in thinking that the Government will have to offer them something

more than drill nights, camp and a bounty. What is wanted in addition are sports activities to attract the men and social amenities to pacify their womenfolk.

My experience is that sport is the best lever, and that if a unit can get just one sports celebrity to join, the rest will come in automatically.

The question of employers giving extra paid leave to camp has always been a difficult one, and is bound to operate unfairly and lead to heartburning as between men in the same unit. I see no reason why employers should have to subsidize the T.A. and I consider that the only fair way is to increase the bounty to whatever is necessary to avoid men losing money by attending camp.

The policy of the War Office in recent years appears to have been to pick the best officers in the Army for D.T.A. This is as it should be, but continuity is equally desirable.

I am sure that we are very grateful to General Erskine for his admirable lecture and I will ask you to show your appreciation in the usual way. (*Applause.*)

THE PRODUCTION OF ARMY OFFICERS

By "LICTOR"

THE February number of the R.U.S.I. JOURNAL contained an interesting account of three lectures, and the discussion arising therefrom, on the "Supply and Training of Officers" for the three Services. Perhaps not the least interesting part of them was the demonstration of the extent to which each Service controls the methods of training and selection of its officers.

To the Royal Navy is accorded the opportunity of carrying this out in the way that it wishes to; that is to say, naval officers are considered not to be without some knowledge of how to train others in their craft. The officers of the R.A.F., who are regarded by the general public as being progressive to an extent unknown to the older Services, are equally fortunate. Both the Royal Navy and the R.A.F. possess the additional advantage of being regarded as working in elements and under conditions of which the normal civilian has little knowledge. It is rare for any critic to express an opinion on the training, administration, dispositions and strategical and tactical handling of sea and air forces unless he has some knowledge and experience of these matters.

The Army is not so fortunate. There would appear to be few citizens of the United Kingdom so modest as to imagine that there are any aspects of the application of the military art to land forces on which they are not competent to form an opinion, or who are diffident in expressing that opinion. More especially does the citizenry imagine itself to be able to judge of who is, and who is not, a fit and proper person to assume command of troops in numbers great or small; so much so, in fact, that it is essential for any General in high command to make himself into nothing short of a public institution which cannot be swept away by the ebb and flow of public favour. In a democracy it may on occasion become necessary to defer to the views of the people; and, as the Chairman indicated in his summing up, this business of the selection of officers is one of them.

It must be accepted that the process of selection and training of officers for our Regular Army must be such as to appear democratic. It is, of course, not inadvisable that it should also be efficient. Almost every officer will agree that for the past few years selection has been democratic, but few will disagree with the statement that, *pace* the selection boards, it has lacked efficiency.

Although the constitution of an army cannot be other than autocratic, entry to its autocracy can, without loss of efficiency, be made available to any suitably qualified person. It is suggested that service in the ranks is not a suitable qualification, but rather a disqualification. There is scarcely any doubt that practically every officer who has spent the normal short period in the ranks is the worse for it. It has been argued that, should an officer not have served in the ranks for some period, he will have no knowledge of the men. This would appear to pre-suppose that every officer is the son of a duke, a film star, a member of the Coal Board, or some other being who dwells in marble halls, whereas, of course, during the late war officers were recruited from large numbers of the men in the ranks who had the education and ability to fit them for commissioned rank and from a great many more who had only one or neither of those qualifications. If these officers were, from the knowledge gained during their stay in the ranks, better able to understand and sympathize with their men than the pre-war Regular from Sandhurst, the fact escaped the notice of

that extremely discerning judge, the private soldier. On the other hand, there is no doubt that the period of being herded to and fro, checked and checked again and supervised in their every motion did much to reduce the sense of responsibility and initiative of all of them, and to reduce their value when they eventually did become officers.

It is essential that every officer shall from his earliest association with the profession of arms be accustomed to the idea that, however much of a dog's body he may be as a Cadet, he is disciplined with the utmost strictness principally with the end in view that he shall, when he comes to a position of authority, exact from his subordinates the standard set to himself. There must always remain in his mind the thought that it is he who is eventually to supply the initiative, he who is to set action in motion, he who is to direct and lead operations, and he who is to be responsible for their success or failure.

Consciously or unconsciously the ex-Public School boy and Sandhurst Cadet had this in his mind. Even in the 1920's and 1930's the idea did not entirely desert him; and the generation imbued with it which went to war in 1914 produced what was probably the finest body of regimental officers the World has ever seen.

However, we cannot recruit our officers from a limited number of Public Schools now; and, indeed, they are no longer the most suitable nurseries for officers, for in their training of character they now place emphasis on comradeship rather than leadership.

The course to be followed is clear enough: the Navy, accustomed by long tradition to train its officers from childhood, discovered it long ago. We must have a military Dartmouth. The Royal Military Academy, Sandhurst, must cease to be a sort of military University and must become a military Public School. The age of entry must be about fourteen years. The Army must not make the mistake recently made by the Navy and set sixteen as the age for entry. All over the country to-day there are schoolmasters persuading parents and boys that it is better not to try for Dartmouth but to wait for the Special Entry. No master is going to be anxious to let any promising boy leave at sixteen when he is just beginning to show his qualities; nor is any boy who has just ceased to be a new boy anxious to repeat the experience in the immediate future. Sixteen is a less unsuitable age for a Secondary School boy, but it is also too late to catch him. The Army must have charge of his development from an earlier age.

The general public cannot logically complain if, at such an institution, Cadets who are unquestionably going to be future officers are taught to consider themselves as future leaders and men in authority. Entry to this institution must be open to any boy of the appointed age and physical standard. He must be required to reach a certain standard of education. After that it does not matter in the least what method of selection is adopted, provided that no boy receives an unfair advantage. We can have the old-fashioned interview—ten minutes before a Board; we can have the modern interview—four days rushing about like something in a gale of wind; we can make the academic examination competitive; or we can stand groups of prospective Cadets in a circle and count "Eeny-Meeny-Miny-Mo." In the past a moderate Cadet has often made a good officer, and *vice versa*. The comparative abilities of the members of any term at Dartmouth, the Shop, Sandhurst or Cranwell have seldom born any relation to their comparative abilities fifteen years later.

The Cadets having been entered, we had better teach them something. First, we must teach them drill and discipline when they arrive; secondly, we must teach them responsibility by giving them—all of them, without exception—some post of responsibility before they leave; thirdly, we must steep them in the traditions of all that is finest in our Service. This is extremely important. Many officers, both Regulars and E.C.O's, are extremely proud of their own unit and will generously recognize merit in others, but have an attitude towards the Army as a whole which is definitely condescending. We must eradicate that completely. Every Cadet must know how the Néry Battery got its name, what the 57th did at Albuera, what regiments rode with the Light Brigade at Balaclava and all the other stories which are generally known only to the regiment concerned. It does not at that stage matter why the units were in this place or that. What counts is what they did when they got there.

In addition to this, we must give the Cadets a general education such as is given at all Public Schools, a physical eduction combining the methods of Public Schools and German schools, and professional training. The last should include, in addition to the drill and history already mentioned, tactics, study of campaigns, map-reading, organization and administration, military geography, driving and maintenance, weapon training and long periods of training and living in the field. It does not much matter what the general education is—classical or modern—so long as the Cadet uses his brains in some way or another. We have more subjects than a school has, so we must keep the Cadets at the R.M.A.S. until they are 19½.

Under no circumstances whatsoever must we attempt to teach them to be broad-minded. Those who are going to rise to great heights are going to make themselves broad-minded anyway. There is no particular necessity for the remainder to have any particular breadth of view. It is debatable whether the regimental officer is not better if narrow-minded. Be that as it may, everyone who served in the 1939–45 War will agree that the Regular officer of that time was in any case more broad-minded than his (normally) civilian comrades, other than those belonging to the professional classes.

The Cadet having emerged from the R.M.A.S., will undergo certain technical courses to fit him for his arm. After this he will join his unit, which, it is generally accepted, must also teach him something. In fact, the most important part of his training is about to begin. The British Army has a very strong tradition of going about this in the worst possible way.

Before 1939 a newly-joined officer was in many units placed on the square, where the Regimental Sergeant-Major or someone else reduced his standard of drill from that of the Royal Military College to that of his own unit. Presumably the idea was that, as no one drilled as well as the R.M.C. did, these young squirts would otherwise have shown up everyone in the place. That would have been extremely annoying.

T.E.W.T's were held. Certain principles were taught and the knowledge of the young officer was increased, but not always in tactics alone. Everyone safeguarded by a *p.s.c.* disagreed with the school solution for principle's sake. Everyone who was not *p.s.c.* agreed with it for promotion's sake. The embryo staff officer could on these occasions learn a great deal about his brother officers and how to handle his superiors. Many of the victories of the playing fields of Gezireh were won on the battle-fields of the Chobham Ridges. Of course, things are very different now.

The young officer commanded a platoon—as he still does. He was and is closely supervised by his company commander in the training and administration of this body, which musters anything from thirty men to none at all, according to what is happening at the time. It is little exaggeration to say that for the first half of his twenties the pre-war officer was little more than a fag for the Adjutant and the R.S.M. The junior officer is in little better case to-day.

It used to be said, and it was an appalling commentary on the methods of the British Army, that if a battalion had a good C.O., Adjutant and R.S.M., it was good, but if not, it was bad. This at once raised the question, what were the other officers there for? The answer was, of course, because no one realized that the majority of them were, and indeed are, quite unnecessary.

The British Army has always had far too many officers, except perhaps at certain stages of the 1914–18 War. Everyone knows the old concert-party joke:

"Where is your rifle?"

"I haven't got it."

"Haven't got it? What's the good of you? What do you call a soldier without a rifle?"

"An officer."

There was some truth in that before the War. There is even more now, though this state of affairs can very easily be remedied. It is only necessary to reduce the number of officers to reasonable proportions and to ensure that they only do officer's work. Very few officers have much idea of what that is. The author of an article in the May number of the JOURNAL, "Administration and Training," who is presumably paid as a Major, justified as conscientiousness his spending half the week on work for the performance of which no civil firm would pay at any greater rate than £6 per week for a forty-eight hour week. Other officers, reading that certain of the higher commanders leave all details to their staffs in order to free the brain for higher thoughts, imitate them to the utmost of their ability. Unfortunately this ability often does not rise to having any thoughts at all and the freedom of the officer's thought is then reflected in the freedom of action which his command, under this system, enjoys. If we had only enough officers, instead of too many, they would very soon find out what essential work is.

In this connection it is of interest to study the organization of what was, until August, 1947, the Indian Army. In 1939, its cavalry regiments and infantry battalions, which were separate entities loosely grouped, had each, on an average, about eighteen officers. About eight of these would be in extra-regimental employment, leaving ten for duty. Two of these would probably be in the U.K. on long leave, which was usually available in one year in four. Of the rest, one at a time would be on a course and one on short leave in India. Six officers would be present. They would probably perform the following duties:—

Commanding Officer	1
Second-in-Command and O.C., Headquarters Company	1
Adjutant	1
Quartermaster and Signals Officer	1
Officer Commanding, A and B Companies	1
Officer Commanding, C and D Companies	1
	—
	6
	—

The most senior of these officers might have as much as thirty years service, another might have twenty, two might have between five and ten and the remainder less than two. They held their substantive ranks and nothing more.

Each of the duties enumerated above, even when not performed in conjunction with another, entailed considerably greater responsibility than the corresponding post in a British battalion, except perhaps in the case of the Quartermaster. He, by the way, was, like the Adjutant, an officer appointed for a period and not, like a British unit Q.M., a permanent incumbent. Establishments have changed since then, and for operations a couple more officers in H.Q. and a company commander for each individual company are desirable.

The officer who has served beside Indian units will immediately say, " Oh, but they had all those Subadars and Jemadars. They did all the work." They certainly didn't do that, but they did do a great deal of work which freed officers for more important duties. They commanded platoons, and the senior ones were capable of taking over the tactical command of a company. They had long service and they were promoted by selection from men in units in which everyone was a desperately keen soldier ; but few of them had the educational background to compare with that of the average British sergeant.

The British Army failed to profit by this demonstration. Before 1939 an officer of the Indian Army was always doing responsible work. He was a fellow who mattered. The junior British Service officer had scarcely any work to do, and what he did have was trivial and over-supervised by his superiors. If two young officers passed out of Sandhurst together and went, one to British Service and one to Indian Army, the latter was, for the first ten years, by far the more valuable. After that, of course, the former was given more responsibility and the climate began to tell on his opposite number, and in time the position was usually, though not always, reversed.

There is no reason whatsoever why ranks corresponding to Subadar and Jemadar should not be introduced into the British Army. The status of both the officer and the N.C.O. would be improved by its introduction. Let an officer always, from his first commissioning, be an officer. Let him be the man who counts. Let us for ever rid ourselves of this dreadful notion that we have not enough officers. In an infantry battalion a dozen is quite excessive. Get rid of anyone who hasn't a full-time job, that is to say, what is at present considered work for four officers in the infantry and five in the R.A.C. Attach him to the R.N. or the R.A.F., send him down in a submarine or up in an aeroplane, make him learn to swim like a frogman or fly like a pilot, let him sail round Cape Horn in a windjammer or cycle from the Cape to Cairo, throw him out of the window, *but don't have any officer in your unit who hasn't a full-time officer's job to do.* You have too few officers when you have less than three in a battalion, and not before.

An officer has two main duties. The first is to think. The second is to impose his personality and his will on his command to such an extent that the results of his thoughts (his plans) are put into action with immediate and unquestioning confidence by his subordinates. He will only become accustomed to think if he finds that he is given a reasonable opportunity of following the course to which his thoughts have led him. His men will only have unquestioning confidence in him if they know him not as a subordinate but as a leader.

It is important, too, that he should be given some freedom to develop his own technique of leadership. The present emphasis on leading instead of driving has led a large proportion of the younger officers to imagine that they are such "characters" that there is no need for them to maintain discipline among their men at all. The results of this idea where it is applied are appalling; and it often *is* applied.

A good leader is better than a good driver, but a good driver is better than a poor leader. In this connection it is interesting to study the characters of the Generals in the Peninsular War—Moore and Hill among the leaders and Craufurd, Picton and Wellington himself among the drivers—and the reactions of the troops to them. A number of Other Ranks have left these on record in their diaries. Men at war do not much change. Competence is the standard by which soldiers judge a leader. They will do for a competent driver what they will not do for the most charming of incompetents (not that it is suggested that Moore and Hill were incompetent).

A short time ago three young officers and a man in mufti were travelling by train They stopped at a station.

"Do we get out here?" asked one officer.

"The men are getting out," said another.

"Then we had better get out, too."

They did, leaving the witness speechless with astonishment.

This was an extreme case, but a great deal of this kind of thing goes on. There is no need for it at all. Even without our military Dartmouth, officer material is not definitely bad. The sooner we accustom it to the exercise of command the better.

THE ANATOMY OF DISCIPLINE

By Captain F. R. G. Milton, M.C.

THERE must be many who, like myself, have personal experience of what the word "discipline" implied before the Kaiser's War, between the wars and during the war just ended; but there cannot be so many who have had the opportunity of observing it in all three periods from the standpoint of the man to whom the current attitude towards discipline matters most—the junior combatant officer. That has been my privilege. Moreover, I have had the honour of going into action with all three Services, and on the question of discipline I have developed strong opinions. There seems to me to be a lot of loose thinking on the subject nowadays; I propose therefore here to set out my views.

Human beings must have indulged in warfare at an early stage in their social evolution, for it is clear that war has played a part of enormous importance in that process. Warfare I define as a conscious striving for mastery by physical violence by a community, as opposed to strife between individuals. Warfare implies, therefore, a certain progress in social organization before it can occur; the existence of a co-operative community, in fact. It emerges in nature at a level far below the human; the hunting of the wolf-pack and of the wild dog can be described as very rudimentary warfare; collision between and raiding by anti-communities is warfare on a considerably higher plane. Warfare on this sub-human level and warfare as conducted by our savage forefathers have one thing in common: the leader was invariably the organism-insect, animal or man naturally fitted to command. As soon as the society becomes more elaborately organized the problem of command becomes more complex and ceases to solve itself automatically; the natural leader is not so readily to be recognized. As civilization progresses a state of war becomes the exception rather than the rule; people's outlook becomes conditioned and their sense of values changes; the mental make-up suited to successful leadership in war becomes less dominant and tends to disappear into obscurity. Even in standing armies, in time of peace the able administrator is often more prominent than the fighting man. At the same time the two most recent wars have demanded armed forces on such a scale that leaders have had to be provided not by the hundred but by the hundreds of thousands. It stands to reason that only a small proportion of those at first provided—and even after years of war only relatively few—will be natural leaders of men. What is needed, therefore, is a system by which the personality of those who are deficient in this attribute may be reinforced—and this is the function of discipline.

That is the manner in which discipline works—by lending force to the personality of the person to whom it gives authority. The purpose of this is that he may be rendered unquestioning obedience.

I stress this fact, distasteful though it may seem to many and contrary though it be to the spirit of the age. It seemed to me that very many N.C.O's, many junior officers and not a few of very high rank indeed felt that discipline was a relic of barbarism and that it was desirable to get by with as little of it as possible and to make that little unobtrusive. This shows a misunderstanding of the nature of discipline and of its purpose. Such an attitude is understandable among civilians newly become soldiers who have not yet fathomed the full implications of their new calling, but that the idea should be allowed to survive the first week of training

shows, to my mind, that many officers and N.C.O's of the Regular Services can themselves have no very clear idea of the nature of discipline and of its purpose. That deficiency I seek to rectify.

Unquestioning obedience is required of the fighting man because it is essential that his formation shall operate as a single body governed by a single will. Greek phalanx, Roman legion, Turkish Janissaries, a hundred instances from our own military history testify to the fact that a homogeneous body of men carrying out (in the old days with precision and in our day with enterprise and energy) the dictates of a single, quite mediocre mind can always defeat an equal number of individually superior fighting men lacking strict direction and control.

Naval officers are fortunate in one thing; modern warfare has not so greatly altered for them the nature of the discipline they have to instil. True, a much higher standard of technical skill is required of the modern rating, but the Captain still takes his ship into battle and his ship's company go with him, willy nilly. Once there, they find themselves in the situation so poignantly described by the old Reservist who marched with the 4th Division into the Battle of Le Cateau: "Some old —— on a horse" he related, "stopped us on the road and told us to fight for King and Country. Then he —— off. Fight for King and Country! Christ! In half an hour I was fighting for me bloody life!"

I am well aware of the standard of discipline it must require to keep men attentive to exacting duties in a naval action; the above is an aside, not to be taken seriously. The fact remains, it is the Army's discipline that modern war has made most difficult to maintain. The modern soldier has to fight in little groups, widely dispersed, and to use his own initiative to a considerable extent. A tremendous responsibility falls upon the N.C.O's, and to my mind the whole problem is to convert the two and three-striped Sids and Berts to Corporal Smith and Sergeant Jones, each with a strong and aggressive superiority complex, an understanding that he is the man he is because discipline reinforces his ego, and a determination to keep himself and his brother N.C.O's in that position of superiority with the help of that discipline. Why I say "and his brother N.C.O's" will presently appear.

Discipline is one and indivisible. By this I mean that an identical standard of discipline must be maintained by everybody. This fact emerges most clearly when we consider certain highly specialized formations: the minor war vessels of coastal forces (M.T.B's, M.L's and the like), heavy bomber aircraft and rescue launches. Each of these vessels or aircraft has a complement of one or two officers and a crew of a dozen or more—a nice little family party. They are thrown together in a small vessel in which they live and operate or in an aircraft in which they fight; they are encouraged in every possible way to think of themselves as a crew; they endure discomfort and often danger together. The temptation to make it a kind of family affair is enormous. In this I speak from personal experience; I have served in a rescue launch in the last war, working with coastal forces and in intimate liaison with bomber crews, both British and American.

The family atmosphere is very pleasant, and it can work perfectly well so long as the commander is a man of strong personality able not only to get the routine properly carried out but, the instant the alarm gong sounds, the crash call is received or the operational flight commences, to shed completely the all-boys-together atmosphere and assume the leader's role, leaving no doubt in anybody's mind that he will show neither fear, favour nor affection and brook no argument until the mission is accomplished. There are such men, quite a lot of them in fact, and they receive a

very pleasant tribute of devotion ; their vessel is always efficient, for they can pick their crews and they find it easy to arouse an intense, parochial *esprit de corps*. But there are not enough of them to fill one quarter of the appointments, and they are a terrible stumbling-block to the weaker brethren. The commander of less forceful personality on the same base will either follow their example of " mateyness " at quiet times, in which case he may fail, when the crisis comes, to carry off the vital transfiguration from elder brother to master or, knowing his own limitations, he will maintain discipline. This will be resented by his crew who cannot see why Mr. blooming Snooks, who isn't half the man Old Smithie of " 4693 " is, and who has done nothing anyway, should be so —— snooty and aloof.

Loyalty to one's brother officers or N.C.O's demands therefore that strict discipline be maintained in all vessels and all aircraft at all times. If not, the efficiency of *other* vessels and units suffers, not necessarily one's own. To make the situation tolerable the other ranks and ratings must understand the reason why this is necessary. That is, in my opinion, the key to the whole situation. It must be made clear, and I mean clear, that discipline is the price it is necessary to pay for the earliest possible victory. In my opinion, the approach to ratings and other ranks should be more or less as follows :—

> War is the antithesis of peace ; in war and, consequently, in training for war, all peace-time values go by the board. The first victim has to be the tolerance and forbearance which make life bearable. It is highly desirable to shorten by every possible means this unendurable state of affairs ; only victory can end it. To attain an early victory it is necessary to develop to the full the fighting value of *every* unit. The full fighting potential of any formation is only developed when it acts as one body, subject to a single will, at every stage in the chain of command. (Here quote from the countless examples available, and not always from the same stereotyped instances.)

It is not claimed that every officer and N.C.O. is a Higher Intelligence. Each is, however, the best available—a sound man to the selection of whom thought and care have been given. Any mistakes made will in due course be rectified. In any case, the system is stronger than the individual. Centuries of experience have shown that better results in war have invariably been achieved by disciplined bodies exactly carrying out the orders of a mediocre leader, than by first class, intelligent fighting men following their own brilliant but individual ideas. For this reason, for the self-preservation and over-all efficiency of the whole, rigid discipline will be enforced.

And that's that. No soft soap about " cheerful obedience " and so forth. The regret is already implicit in the early statement that tolerance and forbearance—the usages of peace, are incompatible with military service which aims at efficiency in war. Men, I have always found, appreciate being treated as adults. They should be bluntly told the worst, told the reason for it and told that they must face it. To half-apologize for the necessity of inflicting discipline and promise that it won't be so bad, leads merely to irritation and discontent when from time to time, as is inevitable, it becomes oppressive.

The subject must be slightly amplified for presentation to officers and N.C.O's who are not only subject to discipline but must enforce it—a process peculiarly distasteful to many intelligent men nowadays. In addition to the matter set out above, they must be told that successful leadership in war is a matter of personality. It is quite ridiculous to suppose that all the thousands of subordinate leaders required will have strong personalities of the right type. In any case, modern industrial life

does not often reveal or develop such personality; appointments are therefore something of a leap in the dark. Intelligence is desirable, but alone is not enough. To supply this deficiency discipline as we know it was invented, certainly as early as 600 B.C. by the Spartans as a result of the terrible lesson they learned in the second Messenian war, and no doubt much earlier by people of whom we have no records. This discipline is given to officers and N.C.O's as a prop to lean on, to fulfil for them the same function that the reinforcing bar provides for concrete. It is up to them to ensure that the strength of this reinforcement is preserved for those who need it by being vigilant that discipline is maintained. Some of them are blessed with personalities which do not need such aids; they could dominate without the backing of Service law. Others no doubt believe they are so blessed but may, at the crucial moment, find they are mistaken. In any case personality is to a considerable extent dependent on factors connected with bodily health, while discipline is constant and enables men, by taking thought, to add many cubits to their stature.

Discipline is worse than useless—it is an actively disruptive element—if it is enforced by some and dispensed with by others. It is therefore essential that even those who can lead without strict discipline should nevertheless insist upon it in order to ensure that its support will be available and effective for the far greater number of less fortunate men who cannot do without it.

The only other essential is to see that discipline is enforced as strictly over officers and N.C.O's as over other ranks. A professional army is in a different category, but when citizens are drafted to defend their country in the ranks the privileges allowed to officers must be strictly limited, and any relaxation of discipline must certainly not be one of them. It is notorious that such serious discontent as was from time to time voiced by the enlisted men of the United States fighting Services was always caused by resentment of the preferential treatment of officers. This is an inevitable outcome of the democratic outlook, and we shall do well to learn the lesson. Democracy and the most cast-iron discipline are perfectly compatible, so are democracy and the granting of certain privileges to rank when rank implies responsibility, but democracy and differential discipline cannot agree.

I feel almost ashamed to put such platitudes on paper, but my own experience has proved that many do not recognize them as such. The fact is, I think, that while to the enlisted civilian this aspect of discipline is entirely foreign, to the average Regular of any Service it is a self-evident truth about which he has never thought at all. The result is that when, in a time of national emergency, the fighting Services are enormously expanded, the Regular expects the new entry to absorb the atmosphere of discipline in the same way that he himself did on joining. When the Regular joined, however, he was one young man entering a large community to whom discipline was the natural order of things. The " Hostilities only " or " Duration " man is differently placed. He comes in, one of a vast number of his own kind, and is taken in hand by a relatively few trained personnel whose technical ability he is prepared to respect but for whose mental outlook, particularly with regard to this mediæval institution of discipline, he holds nothing but contempt. The newcomer fails to understand the necessity for discipline and his instructor fails to understand that anyone can fail to understand a process as natural to him as a Service man as breathing is natural to him as a human. He therefore makes a few perfunctory remarks on the subject, often in half-apologetic vein (realizing that it must all be a bit queer to these poor fishes), and probably adds that strict discipline makes life in the Service more comfortable—a statement which is received in silence and profound disbelief.

The fine flower of this education will be seen later; as an extreme instance let me mention the case of a minor war vessel in which, believe it or not, it was the custom for the commander, who fancied himself as a cook, to prepare the meals for the crew while his coxswain navigated the vessel.

It is easy to see how it came about. One of those "matey" ships, "we're all in this together boys, all I ask is do your jobs, don't let me down" . . .

"This grub is awful, Nobby, I could cook better in a cigarette tin over a candle."

"Bet you couldn't, sir."

"I'll show you, I'll cook dinner to-morrow."

A little flattery, and the situation is established. Of the subsequent history of the vessel and her crew I know nothing; I daresay the coxswain was a forceful personality and that she performed all right, but one can imagine this happening at some later date:

"Increase to 200 revolutions."

"Shouldn't do that, sir, it's driving her too hard in this sea."

The Regular fighting Services have a two-fold duty: the first to police the Empire and take the first shock of war, the second to train the vast numbers of men who must nowadays be drafted into the Services before a major war can be brought to a conclusion. Of their ability to train men in the technique of war there is no doubt, but their success in getting across the idea of discipline was, in the recent war, by no means uniform. I think it is most essential that every man entrusted with this vital task should give the matter thought. He must realize that the idea of discipline is not only foreign to the very nature of the civilian; the civilian thinks it an anachronism, unnecessary, and actually hampering to the war effort. For this reason the instructor must first of all examine his own beliefs on the subject until he is perfectly clear why discipline is necessary. He must then decide how best he can get the idea across. To make a beginning, I have here put down my own ideas on the subject. Both my conception of the nature and function of discipline and my suggestion for the manner in which it should be conveyed may be entirely wrong. If I have convinced anyone that the matter needs attention I shall have fulfilled my object.

HYDROGRAPHIC SURVEYS IN PEACE AND WAR

By Vice-Admiral Sir John A. Edgell, K.B.E., C.B., F.R.S.

FEW people realize how inadequately the World is charted and that it was not until the year 1795 that the Hydrographic Office was called into being. Prior to that date there seems to have been but little attempt to provide reliable charts, in fact they were the responsibility of the individual and in no sense that of any government authority. The consequence was that a Fleet was liable to find itself ill provided with charts and plans of harbours, the material in one ship differing considerably from that possessed by another. An example of the deplorable state of cartography is provided by the battle of Quiberon bay in the year 1746; here, the charts were so much at variance one with the other and with the actual facts that it was necessary to order the Masters of the attacking force to undertake a survey before the ships could move in.

It was not until about the year 1810 that the Hydrographic Office began to make regular supplies of charts to H.M. ships, but this privilege was not extended to the Merchant Navy until many years later.

To-day, the British Admiralty charts have a world-wide reputation for their accuracy and suitability; the old style of piloting a vessel—sometimes referred to as "by guess and by God"—no longer applies, and in general ships can move with freedom and in safety on their lawful occasions. None the less there are immense areas where little or nothing is known of the shape of the land and still less of the depth of water adjacent to it.

It has been said, and the events of two world wars confirm the statement that "war is the Surveyor's opportunity." It takes him to totally unexpected places and very often to coasts and harbours of other nations where normally his surveying activities would be regarded as an infringement of international custom, to say the least of it. But such excursions, even when supplemented by greatly increased hydrographical surveying in British Dominions all over the World, are insufficient and too transient to have a definite effect on hydrography as a whole; moreover, it stands to reason that the only new work which can be undertaken in time of war is work which has a direct bearing on strategy and the conduct of operations, and may prove of little benefit to the Merchant Navy although of paramount importance to the fighting ships.

In peace-time it has been the practice for many years to employ four vessels, each of about 800 tons displacement, on surveying duties in Home Waters and four larger ships on foreign stations, the period of activity of the latter being determined by climatic conditions which, not infrequently, necessitate a complete change in the type of survey and in environment. In Home Waters, much of the work is of the nature of maintenance survey; such places as the Thames estuary, the Downs and the channels between the banks on the East Coast of England are in constant need of re-sounding, and while in the past great attention has been given to making detailed surveys of the lochs, harbours and anchorages of the British Isles, it is now high time that a determined effort should be made to chart with meticulous accuracy the whole of the waters surrounding these Islands at least as far as the edge of the continental shelf, for at present they are imperfectly known and based on data obtained nearly a hundred years ago.

The ships working on foreign stations have a greater variety of employment

than those in Home Waters and may at times be called on to undertake the survey of a locality which is completely unknown. Such work calls for much ingenuity on the part of the officer in charge of the survey, and while it is necessary to delineate the coast line and to add such topographical detail as is essential to the navigator, it must never be forgotten that the crux of the whole matter is the depth of water. This point was clearly and forcibly expressed by Admiral Sir Francis Beaufort in a letter to Captain Sir Edward Belcher in which he wrote—" What I require of you, my friend, is a harvest of soundings " and what was true more than a century ago is equally true of the present day.

In the early days of hydrographical surveying, it fell to the lot of the British Navy to undertake surveys all over the World and an enormous quantity of material was sent in to the Admiralty, there to be digested and utilized for the compilation of charts, sailing directions, etc. Perhaps the earliest British endeavour to provide charts was at the instance of the Honourable East India Company whose Hydrographer—Alexander Dalrymple, was the first to hold a similar appointment under the Admiralty. The surveying activities of India have been practically uninterrupted for at least 150 years. Then, some sixty years ago Canada started to survey her own coasts, to be followed later by Australia and South Africa, and if rumour speaks truth, New Zealand will ere long follow suit. Such work undertaken by the self-governing Dominions has, of course, eased the strain on the Royal Navy, but when the vast areas requiring attention are considered, it is evident that a full programme of work can be found for a large fleet of surveying ships for many, many years to come.

It is the duty of the Hydrographer of the Navy to make recommendations to the Board of Admiralty as to the localities which require to be surveyed and the order of priority which he deems appropriate; the needs of the Royal and Mercantile Navies must both be considered and it may well be that the over-riding requirements of the Naval Staff will necessitate the re-adjustment of a carefully balanced programme of work designed to answer the call for surveys by all applicants. It is only right that the Royal Navy should have first call on its Surveying Service, not alone because that service is a part of itself but because the defence of the Empire must take precedence of other claims.

War, when it comes is invariably full of surprises, amongst these the choice of locality where much of the fighting takes place is often the prerogative of the aggressor and at times of the weaker Power. Modern methods of warfare tend to increase the uncertainty as to the particular part of the World in which attacks will take place and wherein the decisive battles will be fought, and it must be clear to any normally intelligent person that the difficulties attached to the prosecution of a successful plan of attack or defence are greatly increased by lack of adequate and accurate charts and maps.

The Wars of 1914-18 and 1939-45 amply demonstrate the need for accurate surveys and the unexpected coasts on which operations may be necessary. During the former, operations were necessary in the Falkland Islands, on the East and West coasts of Africa, in the Red Sea, the Dardanelles and numerous other places. It is doubtful whether at the beginning of that war anyone expected to find this country involved with Turkey as an enemy. The charts of the Aegean are for the most part based on very old surveys and by no means up to the standard required by modern deep draught vessels. The same remarks apply to the Falkland Islands

and to a great part of the coasts on either side of the Red Sea, whilst so far as the African campaigns were concerned, certain places where important operations developed were almost unknown hydrographically.

Apart from the difficulties of pilotage, the inaccuracy of orientation and scale and at times the complete absence of any sort of triangulation made it extremely hard for adequate support to be given to troops by the force covering a landing, whilst indirect fire without aeroplane spotting, was a waste of ammunition. In the interval between the two wars some attempt was made to overcome the deficiences in charts of certain strategic areas overseas but, as so often happens, the trend of the fighting and the tactics and strategy of our opponents soon transferred operations to places far removed from those in which serious fighting had been expected.

In the 1939-45 War, the unwillingness of Eire to permit the use of her harbours by our anti-submarine and convoy forces, coupled with the developments of German strategy, led to the occupation of the Faroe Islands and Iceland. Hydrographically, of course, these places could not be called a British commitment, the fact remains however that the harbours and anchorages which we wished to use were insufficiently charted and had to be surveyed afresh. Other ports and anchorages required in connection with the assembly of convoys both at home and abroad were constantly being called into use and such widely separated places as Gambia, Trincomali and Mombasa had all to be hastily and thoroughly re-surveyed to meet the needs of the hour.

It is possible that the Japanese descent on the Solomon Islands and New Guinea was anticipated, though this is unlikely to have been the case before the overthrow of the Philippines, the fall of Singapore and the capture of Java. Be that as it may, the fact remains that war was brought to these places and, in so far as the British portion of New Guinea was concerned, to a locality covered at best by sketch surveys. The Solomon Islands were in little better shape, the South coast of Florida and the North coast of Guadalcanal were well surveyed but the rest of the group left a good deal to the imagination and much of the coastline was completely unknown.

It would not be right to omit all reference to the tremendous efforts made by the hydrographic surveyors of the Royal Australian Navy, the Royal Navy and the United States Hydrographic Office and Coast and Geodetic Survey, to rectify omissions and produce accurate and adequate charts of the area of operations; they performed an exacting, and dangerous task under great difficulties; compiled and issued their own charts, and successfully overcame all obstacles. The real point, however, is that these war-time surveys ought not to have been necessary.

Turning now to the landing in France, 1944; from a purely hydrographical point of view, the plan to land at Aramanche was about as bad as it could be. The French survey was about a hundred years old and the British charts were on a very small scale. Fortunately, further information was obtained and it was found possible to compile a series of charts on a sufficiently large scale for operational use.

Chart-Maps

A war-time development of considerable interest and importance was the so-called "chart-map." Production of these had been advocated in 1918 or thereabouts but it had been found impractical to co-ordinate the requirements of the three Services into a serviceable whole without confusing the information portrayed. The need for some such chart became apparent when the invasions of Sicily and

Italy were being planned and a series of charts of the South coast of Sicily were prepared on which the land features were portrayed as on a map, and the Army grid was superimposed over land and sea. The scale selected was suitable for navigation and bombardment and the chart-maps appear to have answered their purpose admirably. It is perhaps needless to say that similar chart-maps were compiled for the landing in France and again proved more than useful.

The British Admiralty claims to chart the whole World, and it is true that charts of every part of the World are published and issued; but though they are as accurate as possible to the date of issue, there are still many parts of the Empire which are unknown or inaccurately charted. The need for more and more surveying is pressing; nearly all the coast line of New Zealand is inaccurate; much of the North and West coasts of Australia is almost unknown; the Pacific islands, New Guinea, the Falkland Islands, the coast of Africa and some of the West Indies are badly in need of attention. It is impossible to say when all or any of these localities may be of the utmost importance to the conduct of operations.

The inventions of the world wars adapted to the requirements of peace-time have provided the hydrographic surveyor with time-saving apparatus and the means whereby he can fix his position, within limits, when out of sight of land or when in a fog. These adjuncts increase the speed with which a survey can be completed but they are not the whole answer, there is so much to do that the only satisfactory remedy is to employ more ships on hydrographical surveys and oceanography, and if any should think that this would be a waste of manpower, let him remember that an accurate chart is a form of insurance and that the little ships which are used for surveying turn out many first-rate practical seaman of whom we cannot have too many.

MILESTONES OF MILITARY AVIATION

By Group Captain G. W. Williamson, O.B.E., M.C.

IT is a striking fact that the latest edition of *Jane's All the World's Aircraft*[1] shows, as regards three great Air Powers, a war potential never previously reached. Ten years ago Leonard Bridgman deduced, from the small number of pages allocated to France in this Annual, that her military aviation was declining owing to irresponsible government, the 40-hour week, and a general disinclination to work hard. The opposite is true of democratic Powers to-day, for though the sections devoted to the United States of America and Great Britain are larger than ever before—over 140 each, Russia, on the other hand, occupies only eighteen. At first sight the small number of new Russian types announced or ferreted out might be attributed to the iron curtain; but in that curtain there is a small hole. It was S. D. Gordon—the famous mission speaker, who said "You can see a large field through a little hole in the fence," and mass-production engineers will deduce a good deal from three brief statements in this section of the Annual.

Russian Aircraft

"The A.M.30," we read, "was directly based on the (German) B.M.W. VI, but incorporated Rolls-Royce type airscrew reduction gearing, a Hispano-Suiza type accessory drive, and an Allison-type supercharger. . . . The ASH series has been developed from the Pratt and Whitney design . . . M.88B is based on Gnome-Rhone design . . .VK.100 was based on the Hispano-Suiza 12 Y . . . M.62.JR is the Wright Cyclone built under licence." Amongst the Russian aircraft there are copies of the Gloster, Messerschmidt, Focke Wulf (including their tail-first "Ente" or Duck, now named in Russian "Utka," which means Duck), Boeing, and Douglas.

When, in 1916, Rolls-Royce produced the largest aero-engine in the World, it was installed by the Royal Aircraft Factory in a huge fighter, with A.4 largely lettered on its tail. This was delivered by an inexperienced pilot to the Germans at Lille in mistake for St. Omer. But it was not the slightest use to them: with stainless steel valves, gearing of the same quality as the Rolls-Royce car, design and construction intended for the production of 10,000 engines in a series, it was quite inimitable even had the alloys been available in Germany; and we can therefore expect that the Rolls-Royce Nene to be produced in Russia will not be a serious rival in either performance or quantity production to British turbines.

Mr. Bridgman does not mention in this volume the Russian turbines installed in their new jet fighters; nor need he have bothered to do so, since those known to be in use have been described and illustrated in the German section of his last Annual. From other sources it is known that the Russian M.003E is Design 003E of the *Bayerische Motoren Werken Flugmotorenbau* G.M.B.H., better known as B.M.W. 003E; M.003R is a variant of it, with its power augmented by a rocket; M.004D is the Jumo or Junkers 004D; and, most interesting of all, the M.018 is the B.M.W. 018. This great engine, perhaps the largest and heaviest aero-turbine in the World, though not the most powerful, was referred to on page 252 of the Journal for May, 1946. Almost by accident, we know a good deal about the design of these "Russian" turbines. Very soon after the end of the War, in 1945, Sir Roy Fedden brought from Germany one or two complete turbines and parts of the B.M.W. 018. Apart from

[1] *Jane's All the World's Aircraft*, compiled and edited by Leonard Bridgman (Sampson, Low, Marston & Co., Ltd.), Thirty-Sixth Edition, £3 3s.

size, the striking features were poor design, low quality of materials, and very short life—perhaps 40 hours in the air as compared with at least 500 for British turbines: not at all the type of engine which the pilots or engineers of an industrial Power would tolerate for a moment.

Piston Type Aero-Engines

The engine section of the book has 93 pages and 140 fine illustrations, including one helicopter engine with vertical shaft, and a flat Lycoming engine to fit into a thin wing. The section has an interesting preface by Air Commodore F. R. Banks, C.B., O.B.E., who was not only Director-General of Engine Production at M.A.P. but also Director of Engine Research and Development. Apart from his comments on gas turbines, referred to below, he points out that in forty years the power of the aero-engine has risen from 35 h.p. to more than 3,500; and the altitude at which sea-level power can be maintained has risen from sea-level to 30,000 feet.

In the Annual which appeared in 1946, there was not a single piston engine of which it was stated that the power exceeded 3,000 h.p., as this information was not available when the book was printed. Now there are 7: Great Britain 3, U.S.A. 2, and France 2. It is heartening to see in this new edition the technical revival of our old Ally, sick and in prison for so long.

Supposing the standard of horse-power were set a good deal lower, it is surprising to notice how few big engines there are in the World: above 1,200 horse-power, and including those above 3,000, Great Britain has 4, U.S.A. 11, France 3. No article on aero-engines would be complete without mention of the Rolls-Royce Merlin, which amply fulfils the principle laid down as desirable by Air Commodore Banks, that "a successful engine should last as a basic type for ten years and sometimes longer." Sir Roy Fedden said in 1944 that he would not be surprised to see this 1,750 h.p. engine reach 2,000 h.p., or 170 h.p. per cylinder.

Perhaps the best way of marking the stage of development of the great engines is in the form of a table:—

Specific Weights of Largest Aero-Engines

Maker	*Engine*	*Litres*	*H.P.*	*Weight*	*Lbs./H.P.*
Napier ...	Sabre 7	38	3,000	2,540	0.85
Hispano ...	24.Z	70	3,600	3,190	0.89
Pratt ...	Wasp Major	71	3,500	3,470	0.99
Arsenal ...	24.H	70	4,000	4,070	1.02
Bristol ...	Centaurus	54	3,000	3,170	1.06
Rolls ...	Eagle 22	46	3,500	3,900	1.12
Lycoming ...	XR.7755	127	5,000	6,050	1.21

The weights stated are for the dry engine, bare; the horsepower is the maximum. Of the above engines, Centaurus and Wasp Major are air-cooled. It will be noticed that in these large sizes, the air-cooled engine has little or no advantage in weight over those provided with water jackets; and when coolant and radiator are added for one, and cowling and ducts for the other, the percentage addition to the weights is almost exactly the same for both—50 per cent. for air-cooled, and 52 per cent. for liquid-cooled.[1]

The Lycoming monster is not included in *Jane;* it has 36 cylinders in four radial rows, is liquid-cooled and has a two-speed geared drive for contra-rotation of

[1] Fedden, *Aircraft Power Plant Past and Future.* (Royal Aeronautical Society.) 1944.

propellers. Its specific fuel consumption is about that of a Merlin—0.43 pounds per h.p./hour cruising speed. Hispano and Arsenal are both French; the latter is built by the Arsenal de l'Aeronautique.

The Arsenal engine "is largely made up of components from the Junkers Jumo 213 engine." An illustration shows two of these engines in tandem, connected apparently by about a yard of co-axial shaft, i.e., one shaft running inside the other, which is tubular. This tandem is intended to go inside one wing of a large flying boat, the rear engine driving the front propeller.

Shaft drive, not much in evidence in previous volumes of *Jane*, has become much more frequent of late. It is, however, not new: the Bristol Tramp—a cargo aircraft of 1922, had four Armstrong-Siddeley Puma engines buried in the fuselage; and as far back as 1931, Fiat coupled two V.12 engines in a line to drive a propeller at each end of the aircraft. It worked sufficiently well to obtain the World's speed record in that year. The most striking modern example of shaft and gearbox drive is that of Bristol 167, still affectionately called "Brabazon."

Turbines and Rocket-jets

The Introduction by Air Commodore Banks points out that there are two main types of turbine: the Derwent and Nene are of the simple Whittle type, in which the incoming air arrives at the centre of the single-stage double-sided centrifugal compressor, and is flung outwards to the periphery to compress it; and the axial flow type, where the movement of the air is parallel to the shaft, and it is compressed by turbine blades in a series of stages. Turbines have a compression ratio not much greater than that of piston engines; but Banks estimates that it might rise to 12/1 in time.

The Nene is licensed in several countries, including Russia. It has the great advantages that it is simple and quick to manufacture, and it is light in weight. Banks says of the axial flow type that it is smaller in diameter, has a higher air throughput, is capable of higher compression ratio, and has a higher adiabatic efficiency. "There are about 2,000 blades of different shapes and sizes, including the compressor blades, the nozzle guide-vanes and the turbine blades." In course of time, we may expect the axial type, despite its complexity, to have a much better fuel consumption than the Whittle type.

Turbines have two applications in aircraft: they can be geared to a propeller, in which case there is still a certain amount of jet effort; or the jet alone, correctly styled "the reaction jet," is used for propulsion. The jet effort of a propeller-turbine, a turboprop as the Americans call it, might form a third or a quarter of the shaft horsepower.

For simplicity in calculation, it has been assumed that the aircraft carrying these engines will reach a speed of 375 miles per hour, at which one pound of thrust is equal to one horsepower. If so, Bristol Brabazon II, which will have four coupled pairs of Proteus engines, would be propelled by 32,000 h.p. The Saunders-Roe boat will have in addition a single Proteus on each wing, making 40,000.

The fuel consumption of these turbines, using a much heavier oil than petrol, might be about 0.6 pounds per h.p. for propeller drive, as compared with 0.45 pounds for a Merlin, about 0.7 for Nene and Ghost, and more than twice that for Russian turbines of German design.

Banks points out that the difficulties of design and manufacture of turboprops are much greater than with turbojets, owing to the propeller gearing. In these large turboprops, Britain has no rival.

As regards turbines intended solely for reaction drive, it is interesting to look back about two years, to the statement on page 251 of the JOURNAL for May, 1946: "the power-weight ratio of the turbine is not yet, at speeds within our reach, four times as good as that of the piston engine." In the intervening months, two British and two American turbines have been brought down to that weight efficiency. The engine weight per horsepower of French and Russian turbines is twice that of the Nene, which is 0.23 lbs. for its 7,000 odd horsepower.

During the last two years, other types of propulsion have been invented or, rather, developed. Here and there throughout the book the term "ramjet" is used; in this country it is called the athodyd, or aerial thermodynamic duct. This is the simple but not very economical engine which the Germans used to power the V.1 flying bomb. The Russians apply it to assist take-off, and one American helicopter drives the blades round by an athodyd on the tip of each! There are two kinds of athodyd—the resonant or pulsating jet of V.1, and the jet effect of a volatile fluid burning in a tube with one end closed. This does not sound very important; but in all types of turbine, the jet effect can be greatly increased by augmenting the thrust in this way. After the turbine, and before the jet, fuel, or a water-methanol mixture, or ammonia, can be injected into the turbine flame, increasing the volume and the pressure of the hot gas, and therefore the horse-power or thrust. Banks says that this use of fuel, styled "afterburning, has a better future than the injection system because it is somewhat less expensive in fuel consumption, and as it uses engine fuel no separate tankage is required." Using afterburning, the power of the Rateau turbine is increased about 17 per cent.

J.A.T.O., or rockets for jet-assisted-take-off, have been further developed; and one American aircraft has been carried into the air and released to pierce the sonic barrier in a piloted rocket flight of about 156 seconds.

JET AIRCRAFT

There are illustrations of D.H.108—the single-engined tail-less monoplane with which De Havilland broke the World's record for a closed circuit. The fact that this aircraft made its turns at about 600 m.p.h. shows that it is strong enough for fighter use. Two other illustrations show the new Hawker and Gloster single-engine fighters, no speeds being stated.

Speeds of 600 m.p.h. impose aerodynamic developments upon the airframe which had not been widely applied to production aircraft in 1946, when the previous edition of this *Jane* appeared. Perhaps the most important is the thin wing, or rather the very thin leading edge, followed by a wing almost without camber, gently tapering and very slender. Swept-back wings have arrived, and those of D.H.108 sweep back at nearly 45°; tail plane and fin are swept back also. Engines, apparently, can be anywhere, either faired into the wing or in emergency hung beneath it; but it is important that the nacelles should be cigar shaped, long and thin, rather than egg-shaped. One or two very fast aircraft house the engines in the belly. There must be no bumps or protrusions, and where one surface joins another, as at the junction of wing and body, they must be gently faired together. Not only the outlines, but the surface, must be smooth—no rivet heads, no dimples; not even a metallic surface is good enough, it must be polished. This is the design one may deduce from the

600 m.p.h. aircraft illustrated and described in this year's Annual. The D.H.108 must come very close to it, especially as it has no tail. Other tail-less aircraft include the Armstrong Whitworth AW52, which will do 500 m.p.h. with two Nenes, and the Northrop YB 49, with eight Allisons, 54,000 h.p., speed not stated.

Of conventional production aircraft, the Supermarine Attacker looks good, but with surprisingly little sweepback; North American N.A.140 has a sweepback of more than 30°. Speeds of British aircraft are stated as "Maximum continuous speed at sea level," but American data say "More than 650 m.p.h."—just like that! This is the statement of speed for N.A.140.

American Types

The American firm of McDonnell must be mentioned, if only because they have stolen a march on De Havilland: two of their aircraft are named Banshee and Phantom, the former stated to be capable of 630 m.p.h. The same firm produce a "little flea," named Parasite—a fighter with folding wings to be carried in the forward bomb-bay of Consolidated B.36: it is launched and picked up by dirigible-type release gear; there is no undercarriage, and speed is stated as 600 m.p.h.

The U.S.A. has apparently more than six excellent jet-bombers in production. The North American XB 45 Heavy Bomber is most graceful in flight, though its wings meet the body at an uncompromising right-angle. Its span is 89 feet, and it is powered by four Allisons, 27,000 h.p. The slender body and long thin nacelles are remarkable. Speed is stated as 500 m.p.h.

These figures are given for comparison with the most remarkable, and perhaps the most important aircraft in the book; this is the Boeing Model 450, or B.47, now going into unlimited production. It spans 116 feet, and when loaded, weighs 60 tons; total horse-power is 40,000, and it has 18 rocket units for use on take-off or other emergency. Wings, tailplane and fin are swept back at about 45°. The Boeing Magazine for October, 1947, said: "From final blueprints to completed aeroplane, the XB.47 required just one year and three months." The main wheels are in tandem, and retract into the body, with small outrigger wheels under the engines. This is the aircraft which, it has been plainly stated in a responsible American journal, is designed to carry what they call "The Absolute Weapon."[1]

The last Volume was remarkable for its summing up of the manner in which the British Empire and the United States of America turned the tables upon the aggressor nations, though we began the War unprepared. "The effect of 47,000 tons of bombs on Berlin; 827 German aircraft destroyed in one day; in one day also Typhoons put 135 tanks out of action; the devastation of factories, bridges and railways must be seen to be believed."

This Volume shows that for the first time in history, democratic nations may be properly equipped to fight a defensive war if it is thrust upon us.

Except where otherwise stated, all the above information is taken from Mr. Bridgman's book, upon which he is to be congratulated warmly. The 725 illustrations include half-tones of high quality, and the outline plans are invaluable; many of them have been drawn, doubtless during a busman's holiday, by the energetic Editor himself. Each important section has a comprehensive index.

[1] *Saturday Evening Post*, "If War Comes." 11th September, 1948.

THE OFFICER'S WEAPON OF THE FUTURE

By Lieut.-Colonel L. V. Stewart Blacker, O.B.E., *p.s.c.*, A.F.R.Ae.S.

WHEN working out the evolution of a weapon to perform a particular task, one usually does best to commence by considering the projectile and the effect one wants it to perform on the target. As matters stand at present, the target for the officer's weapon will be an unarmoured man, who must be stopped even when stimulated by the lust of battle, and dropped in his tracks.

We know that some four hundred foot pounds of striking energy will bring this about. We know also that a conventional bullet can be given a velocity of well over three thousand feet a second, from which the less profound arithmetician might deduce from his formula $E = \frac{MV^2}{2g}$ that a bullet weighing only 1/350th of a pound, or twenty grains, would do the trick. Such a bullet, half the weight of a .22, could be made to a diameter of perhaps .177, or that of a small air pistol. This jolly theoretical reasoning crashes to the ground in fallacy because a tough fighter, imbued possibly with a righteous belief in the divinity of his monarch, will disregard holes in his cuticle of a mere .177 diameter in a most tiresome manner, especially if they come in at one side of him and out at another. The rude lessons of close fighting teach us, vividly, that even a 9 mm. or .357 inch bullet is rather small, and that 11 mm. is just about adequate. An explosive bullet of .177 or .22 is ruled out by the laws of war and the problems of the production engineer. All the same, we must be powerfully attracted by the notion of a very light bullet, for two reasons. Firstly, we want very much to keep down the weight of our ammunition, and secondly because, *mutatis mutandis*, the lighter the projectile the less recoil there will be for the projector to absorb, and so this in turn can be lighter and smaller. We could, of course, make a bullet of some light alloy at a diameter of 11 mm. and give it ample muzzle velocity with which to perform its task. The drawback of this will be that it will rapidly lose this initial velocity and become ineffective both by loss of striking power and by acquiring a curved trajectory and such a steep angle of descent that a too precise judging of range by the user will be necessitated.

The inventive mind, at this point, flashes across to the rocket, and the inventive mind will probably not be far wrong. A rocket does not need a high sectional density, or wd^2, wherewith to store up the foot pounds of energy which carry it towards the target because it contains another, and better, store of energy in the cordite, or nitro-cellulose or whatnot which is inside it.

All the same, one must not imagine that thirty or forty grains of cordite contained inside a rocket type of projectile will develop more energy than the same amount put into a cartridge and used to propel a bullet of high density. No, the practical advantages arrive from other directions. Let us imagine a rocket-assisted projectile of an aluminium alloy, or even of a plastic, of about 11 mm. diameter, containing some forty grains of propellant, streamlined and stabilized by a suitable tail. This can be discharged from a smooth-bore barrel, at an initial velocity of a good many hundred feet per second, by a charge of roughly a dozen grains or so.

The reasons for this initial projection are several. It constitutes a compact and convenient means of initiating the rocket, saving the use of electricity or electrickery. This flying start contributes toward the efficiency of the rocket itself and, moreover, it lays the foundations for accurate flight and a reduced dispersion.

Another very convenient by-product of the primary projection cartridge is that the recoil from it, though very small, can be used to feed up fresh rounds from a magazine. This brings us to the very great advantage of rocket-assistance, which is that the parasite weight of the cartridge will be only a trifling proportion of the total weight of the round, perhaps only 10 per cent. as against 43 per cent. in the .303. The chamber pressure will be so low that aluminium may be used for the case which will not need a rim, and may even be made to function without either extractor or ejector. Incidentally, this discharge will be almost noiseless and practically flashless.

In brief, our proposed equipment will fire a cartridge lighter than the present 9 mm. but with a projectile of 10 or 11 mm. in diameter. This projectile will contain most of the propellant and consist of a mere light alloy shell provided with a rocket nozzle, an igniter and a stabilizing tail. The primary cartridge to impel this need be only about ⅜ in. long, and of trifling weight. The projector is, as we have seen, a "self-loading" smooth-bore with a suitable magazine. This latter, so far as the officer, or the infantry section commander is concerned, need only contain a dozen rounds. Obviously with such a small charge and low pressure, no question at all of cooling will arise. We are left with a consideration of what military performance we require. Were we only to deal with the officer's personal defence, a fighting range of fifty yards would be enough, assuming small dispersion and a flat slope of descent. However, nowadays the case is altered, and to bring Drake's phrase up to date "the gentlemen must shoot it out with the thugs." The "thug" variety of the art of war has been dominant in many countries since March, 1917, and although the gentleman cannot copy its methods, he may at least arm himself with a suitable weapon.

For "thug" warfare, therefore, we would do well to envisage a projectile which would reach a target at not less than 400 yards, and possibly at 600 or 800 with a shorter time of flight than that of a .303, and flashlessly and noiselessly to boot. With a "time of flight" so brief as this, our trajectory will be only very little curved, therefore the mental stress of range judging will be avoided.

NOTE.—*This subject is further discussed in "Correspondence."*—EDITOR.

INFLATION AND DEFLATION

By Lieut.-Colonel T. H. Sweeny, O.B.E., R.A.P.C.

FOR the past year it has been difficult to read a daily paper without coming across the words "Inflation" and "Deflation," and during arguments they are used so often in exactly the opposite sense to the one intended that it is no wonder people confuse them. The housewife knows that Inflation means that prices of things go up, and hopes they will drop when that mysterious process called Deflation commences, but what they really mean, or what causes them, is usually beyond her. It need not be, if we forsake all learned definitions and understand clearly what "wealth" means.

The really important kinds of wealth are listed in the dictionary under "H"—Health, Happiness, Homes; a long way further down, under the "M's," come Money, Miserliness and Misery. So many people confuse this order and put Money first, when Money by itself is only of value as a means of exchanging something for something else and has no intrinsic value of its own. The reasons why we take a pound note and a half-crown into a shop if we wish to buy a pipe instead of carrying along two coconuts and ten bananas are because the latter are both bulky, perishable and hard to get; also, for all we know, the shopkeeper may want a shirt instead. We know he can get his shirt with pound notes, but his haberdasher might reject bananas. We, in our turn, got the money we have just spent by working so many hours or days for it. Shall we say the pipe cost us one day's work? It was cheap if we felt it was worth two days' work, but dear if we only intended to exchange half-a-day of our valuable time for it.

Now we are getting near to the root of the matter. "Time" is the real standard against which we must compute our prosperity or otherwise, and a sound knowledge of the real value of our own time is the basis of contentment—which is happiness and so real wealth. What *is* the value of our time? It depends entirely on the value of the work we do in that time, and so differs from person to person; but the thing that matters is how much our time is worth to the community—the Nation, for from that alone can we get a true idea of what it is really worth. If a man is being paid five shillings an hour, and he is doing work worth 5s. 6d., the community as a whole is 6d. better off. Moreover, he will share in the general prosperity for they will spend part of that 6d. with him. If he still gets his five shillings per hour but only turns out 4s. 6d. worth of work, the unearned 6d. has to be paid by someone else, and the community (whose fortunes he shares) will be 6d. nearer bankruptcy. What numberless strikes and waste of time (and so wealth) would be avoided if we could only bring ourselves to think of the cost of things we want in terms of "man-hours of work" instead of in pounds and shillings. The size of the weekly wage-packet means nothing; what matters is how much it will buy.

In the days when a mechanic earned £3 a week he could buy a pair of boots for ten shillings, which meant a day's work; now that he is getting £6 every Friday, he must pay £2 for his boots, or two days' work. His wages have doubled but he is not twice as well off; he is twice as *badly* off since he must work two days instead of one for his boots. The Officer or Other Rank who moans about not getting enough money in pay and allowances really means that he considers he cannot exchange his time for enough of the things he wants. If he is working hard he is quite right, but it all depends on whether he is giving value to the Nation for whatever amount he is getting; if not, it is the community that has the grouse.

Now we see that a pound note is only worth what it can be exchanged for, we can also understand that the total number of pound notes in circulation are worth the total goods or services which are available for them to buy. If the total number of notes is doubled and the number of pipes (and the demand for them) remains the same, we shall have to give twice as many notes for our pipe. The converse is also true, and we should get the pipe for half the price if there were twice as many pipes available but still only the original number of notes to get them with. The former is "Inflation" and the latter "Deflation."

Have you got it? You say "of course I knew that all along, but I still don't understand what causes them." The answers are equally simply: Inflation is caused by *waste* and *greed*; Deflation by *hard work* and *self-denial*.

A war always wastes time (and so work) on producing unproductive things which increase no-one's prosperity or, worse still, which destroy the productive things already made. Every heavy bomber shot down represented not only the loss of eight men and the work they could have done in future years, but also the £10,000 spent in training them and £100,000 the value of the aircraft. A great ship sunk may mean a loss of perhaps a million pounds as well as many valuable lives. Houses destroyed, fields untilled, starving cattle—all are lost wealth that can only be replaced by work done twice over to get the result once. Shells, guns, fighting aircraft, tanks and so forth are only of use for destroying useful things, and the time and labour they take would have been far more useful if spent on making goods that increased our happiness. By the end of the war there are only half the number of useful things left available to buy; but there are probably double the number of notes to buy them with, so each of them will cost four times as much.

The cause of this note increase is, of course, largely greed—which thrives in war-time. People see the chance to demand higher wages for their services and, unless they also decide to do more work to earn them, the notes in issue have to be increased in numbers (or else change hands much quicker) in order to pay them. If they change hands more quickly, the small stock of goods the shops can still get runs out even faster. The shops not only cash in on this situation by raising prices when they realize that the demand for their merchandise is greater than the supply (as they always have done), but they also see that the value of the money paid them is falling, so they hedge against possible loss by raising prices higher still. Food, clothes, rents, houses, everything goes up more than they need do and faster than they ought to, but the common man still feels he is entitled to his pair of boots for one day's work and objects to working two days for them. He therefore, demands higher wages, and usually has to get them if the war is to be won. This leads to yet more notes being issued and a still smaller purchasing power for each one—the experts call this the "Inflationary Spiral." It always has happened, and it always will happen that the producers and owners of goods see to it that they keep one jump ahead of the purchaser once this spiral starts, and wage increases *always* lag behind price rises during an inflationary period, so the common man's true financial position goes from bad to worse.

The Black Market which always springs up under these conditions could only flourish through greed. At the commencement of any inflationary period the curve showing the diminishing value of a currency rises slowly at first, then more rapidly until it gets round the bulge, when it begins to climb almost vertically to an astronomical height where the currency becomes worthless. There is then no alternative to declaring that the whole of the currency in issue may be used no longer, and to starting all over again with a new one. The result is that honest and thrifty people

lose all their lifetime's savings and have to re-commence from scratch; whilst the "squanderbugs" are not damaged at all, for they have nothing to lose.

If such a calamity is to be avoided it stands to reason that the inflationary trend must first be halted and then reversed. How can that be done? There is only one answer—*work*, and the strength of mind to work harder without increased wages. The curve will flatten out and come down quicker still if we are sufficiently strong-minded to work harder for *reduced* wages. After an uncomfortable year or two, calling for real self-denial, there will be much more available to buy and fewer notes to buy it with, so each note will buy more.

This process is "Deflation." The War forced the British to spend half their accumulated money wealth on unproductive matters, which means they lost that portion, and they will never reach their former standard of living until they have *earned* that half back by working more for lower wages. There is no other cure for it.

Our own inflationary curve has already reached its "bulge" and is beginning to creep round it faster. If we pull our socks up and decide to reverse the process now we shall be in for an unpleasant time, but the longer we put off this decision the higher the curve will have risen, and the bigger the bump when we eventually fall back to ground level. Moreover, our bruises will take far longer to heal.

The evil day when the inflationary curve must get out of control can be deferred by borrowing money from America and by other expedients, but it can only be avoided permanently by producing more than we are earning. This is as inescapable a fact as the law of gravity, and there is nothing we can do to change it. Politics do not enter into the matter at all. Is it not plain that waste and greed mean ruin, and hard work and self-denial salvation? If enough people only realized this we would obviously work several hours a week longer and take as our motto "START NOW."

THE EVACUATION OF PALESTINE

By Lieut.-General G. H. A. MacMillan, C.B., C.B.E., D.S.O., M.C.,
late G.O.C. British Troops in Palestine

"THE British Mandate over Palestine was legally ended on 15th May . . . The final British evacuation was completed at Haifa on 30th June . . ."

These short sentences in the August, 1948, issue of the JOURNAL summarize the completion of what was an involved military problem, the arrangements for the solution of which were made in November, 1947, and carried out by the troops concerned with admirable precision in the face of considerable difficulties. Readers may like to know how the evacuation was planned and how it was executed.

On 1st September, 1947, the United Nations Special Committee on Palestine issued their report and from that moment a new phase in the military problem in Palestine started. As soon as the Partition Plan recommended by this Committee was announced, the Jews became hysterically jubilant and the Arabs at first were stunned with disbelief that such a solution as was recommended could be possible, involving as it did the gift to the Jews of such large areas of purely Arab population.

Thenceforth the local situation deteriorated rapidly. Space and the scope of this article will not permit of a detailed list of the numerous outrages which mounted up in the ensuing months, but an analysis of them shows that disorders started with attacks by Arabs on the Consulates of the Powers which had voted against them and that the Irgun Zvai Leumi extremists and Stern Gang soon renewed their murderous vendetta against British soldiers and police, which had diminished appreciably during the course of the Committee's deliberations.

As soon as H.M. Government had decided that British troops would all be withdrawn from Palestine by 1st August, 1948, plans for our departure, based on the G.O.C's appreciation of the situation, were drawn up by the C.-in-C., Middle East Land Forces. They were confirmed after consultation with the High Commissioner—Sir Alan Cunningham, during the first week in November, 1947. It is of interest to note that the plan as formulated at this meeting was carried out almost in exact detail, and that the Palestine Government were in agreement and in step with the Army throughout up to the end of the Mandate and their departure on 15th May, 1948.

The problem with which we were confronted was the evacuation of some 70,000 Service personnel and 5,000 police and civilian officials, 210,000 tons of stores (which, in the event, rose to 260,000), plus unit equipment and unit stores of no inconsiderable proportions. Since the Army would remain responsible for law and order throughout the country until the end of the Mandate, no large scale evacuation of fighting troops could take place before May, 1948, and so it was necessary that the Army should remain in the country for a period after the end of the Mandate before total evacuation could be completed.

No one route—e.g., rail to Egypt, road to Egypt or sea from Haifa—could by itself handle all this load of personnel and stores in the time available even if, as seemed very unlikely, they all remained uninterrupted. It was therefore clear that very careful planning would be needed and all available means of movement and transport would have to be employed to the full.

So long as law and order had to be maintained throughout the whole country,

it was essential to keep adequate forces in the neighbourhood of Jerusalem, Tel Aviv, Haifa and Eastern Galilee, where were the sources of potential trouble. In addition, the road and rail routes to the South had to be kept open as long as they would be wanted. Jerusalem, dependent as it is on water from the plains and on tortuous communications through the hills by which supplies of oil for power and light have to be conveyed, was militarily an unsound position to hold or to evacuate at the last possible moment, but it was politically essential to remain there since the Government functions were centralized in it and the Government could not have carried on from elsewhere.

Given that these four main areas had to be held until the end of the Mandate, the first decision to be made was whether the final post-Mandate evacuation should be southwards to Egypt or northwards through Haifa. The latter was clearly the answer, since it would have been militarily unsound to depend for the final evacuation on long land communications in areas where Arabs and Jews might be fighting, and because a large amount of our valuable stores were already in installations in Haifa and their early move southward would block all other movements. Further, the units in the South, in any case, were due to move out first in accordance with the arrangements for the overall reduction of the Army, quite irrespective of the Palestine situation. Those to leave last were to be the 1st Infantry Division, for whom accommodation in their re-deployment areas had still to be prepared. The 1st Guards Brigade were to be the last of all to go.

The Plan, as drawn up and carried out, was therefore drafted to secure an orderly withdrawal in four clear-cut phases, viz. :—

Phase 1—The evacuation of Gaza and the South by 29th February, 1948, less those troops required to keep open communications with Egypt.

Phase 2—The evacuation of Jerusalem and the hill country of Samaria.

Phase 3—The evacuation of Galilee and the coastal strip and the concentration of the remaining forces in Haifa.

Phase 4—The evacuation of Haifa.

To ensure that the plan should run as required, four essentials were necessary :—

(*a*) Road and rail communications and the port of Haifa had to be maintained in full working order for as long as possible.

(*b*) There must be no serious clashes between the British troops and either Arabs or Jews.

(*c*) The Civil Administration had to be supported to the maximum possible extent all over Palestine until the end of the Mandate.

(*d*) No additional military commitments, from which the troops could not be freed at short notice, could be undertaken.

We were fortunate to be able to maintain these essentials in spite of many irritations and unexpected situations. As far as the railways were concerned, and in spite of several acts of sabotage, we kept them running for a month longer than anticipated. Although on several occasions we were forced to inflict severe casualties on Arabs and Jews when our vital interests were endangered, no widespread conflict with either community ever materialized. The District Commissioners in every District in Palestine continued to function, although to a diminishing extent as time went on, right up to the end of the Mandate. And, finally, although at times the British forces were dispersed in many detachments all over the country and were extended to the limit of their powers as an effective military medium, the whole operation entailed in withdrawing them to the South to Egypt and to the North into

the Haifa enclave, as soon as the Mandate ended, was carried through between dawn on 14th May and 7.30 p.m. on 15th May, 1948.

The following is a brief summary of the problems which confronted the various military commanders in Palestine during this evacuation period.

In the North, the 6th Airborne Division faced two completely different situations, namely that of preserving peace on the frontiers of Galilee and of keeping Haifa itself in running order. Matters in Galilee remained fairly quiet until late in December, 1947, when Jewish attacks on Arab villages commenced. Up to then it had been possible to use the Trans-Jordan Frontier Force to keep order in the Huleh area, but with the threat of attack by Syrian co-religionists from over the border to avenge these Jewish assaults and by Arab insurgents who had collected in the Safad area, this force had, in all fairness, to be relieved by British troops. A composite brigade, comprising the Irish Guards, 1st Parachute Battalion and 17th/21st Lancers under the command of the C.R.A., 6th Airborne Division, was therefore organized and took their place.

In Haifa, both communities were spoiling for a fight which eventually took place on 21st April. After heavy fighting, which lasted thirty-six hours, Major-General Stockwell was able to organize a truce. British troops during this fighting came under heavy fire from both sides and sustained casualties, but on its conclusion were of immense assistance in getting the town running again and in evacuating Arab refugees. All areas vital to our evacuation programme were safeguarded throughout the fighting.

In Central Palestine, the 1st Infantry Division had as their main problems the preservation of order between Tel Aviv and Jaffa and the keeping open of the roads vital to our subsequent evacuation. They also provided the escorts for the prevention of looting on all trains running between Haifa and Jerusalem and between Haifa and Rafah. This proved a serious strain on their manpower. After the departure of the Independent 61st Lorried Infantry Brigade, which had looked after the extensive Gaza District, the 1st King's Royal Rifle Corps were left behind under command of 1st Infantry Division as from 1st March, 1948, to maintain our communications with Egypt. This unit did exceptionally fine work in keeping open the roads on which there were constant fights between Arabs and Jewish convoys proceeding to the isolated settlement in the Negev and near Beersheba.

The most serious event which occurred in the 1st Infantry Division area was the attack by the I.Z.L. on Jaffa on 12th April, when it was necessary for the British Army to intervene in strength. The whole of the 3rd Infantry Brigade was deployed, demonstrations and an air strike were carried out by the R.A.F. and two destroyers and a cruiser of the Royal Navy were called to lie off Tel Aviv in support. The Jewish unprovoked attack on the Arabs was completely broken, largely by the effective use of the tanks of the 4th/7th Dragoon Guards and the armoured cars of the Life Guards, together with artillery fire produced by a battery of 41 Field Regiment, R.A. These operations resulted in an immediate appeal for a truce by the Jews, which was at once ordered and enforced by Major-General Murray the Divisional Commander. Our casualties were one N.C.O. killed and five other ranks wounded. The casualties inflicted on the Jews are known to have been severe.

In Jerusalem the 2nd Infantry Brigade of the 1st Infantry Division, acting in an independent role, were faced throughout the evacuation period with the difficult task of keeping the rival parties from breaking out into active warfare. This they

accomplished by holding key positions in the city between the two combatants, often immediately contiguous with both. Sporadic shooting occurred almost nightly in Qatamon, in the Yemen Moshe Quarter and at Sheikh Jarrah, but it was not until the Jews attacked the Arabs and occupied Sheikh Jarrah on 24th April, thereby threatening our lines of withdrawal through Ramallah, that the brigade commander, Brigadier Jones, had to take serious military action. Two battalions and one troop of tanks were therefore deployed and cleared the area, inflicting casualties on Jewish extremists without loss to our own troops.

As a result of the serious situation which threatened to develop in Jaffa, the C.-in-C. sent reinforcements comprising one infantry battalion, one armoured regiment and two Royal Marine Commandos to Palestine from other Mediterranean stations. These troops were very welcome, as the already diminishing garrison was deployed fully. In the process of operations it had been necessary to weaken the protective arrangements on the vital routes of evacuation between Jerusalem, Ramallah and Latrun and in the vicinity of Lydda and Ramleh. The arrival of these reinforcements caused speculation in many quarters as to whether the British occupation of Palestine was going to be extended, but due mainly to the efficient handling of the situation by the 1st Infantry Division, they were not called upon to take any active part in the Jaffa operations. After the end of the Mandate they were among the first troops to be evacuated from Palestine without hindrance to our planned withdrawal programme. Their provision at a difficult moment was a valuable contribution to the success of the actual withdrawal on 15th May, when the Mandate ended.

After the departure of the High Commissioner, the area occupied by the troops was placed under the military command of the G.O.C., who governed by Proclamation. He was assisted by a small staff of very able senior Government officials who remained with him until his final departure. Five hundred Palestine Police also remained for police tasks in the Haifa enclave, under the direct command of the G.O.C.

During this period the policy announced to the people of Haifa was that the G.O.C. intended :—

(*a*) To ensure the security of his forces.

(*b*) To achieve the rapid and orderly evacuation of his forces.

(*c*) To contrive that, within the area under his control, the normal life of a peaceful and law-abiding community could be carried on for the benefit of all races and creeds living therein.

No incidents occurred ; the shipping programme was fulfilled according to plan ; and the withdrawal of troops and stores was carried out so effectively that our final departure took place on 30th June, one month before the date anticipated originally.

To ensure that nothing untoward should occur in the final phase of our operations, the 1st Guards Brigade with the troops under their command, which included one squadron 4th/7th Dragoon Guards, the Chestnut Troop, R.A., two Royal Marine Commandos and certain Port and Railway troops and ancillary services, carried out their final withdrawal on 30th June in a series of bounds, covered by the R.A.F. and the Royal Navy. The whole force embarked in the course of the morning in four merchant ships, six L.S.T.s, one hospital ship, and some " Z " craft, the G.O.C. and his personal staff being already established on board H.M.S. " Phoebe."

At 11.30 a.m. the G.O.C. went ashore and the Commander 1st Guards Brigade took leave and embarked. The troops of the 40th Royal Marine Commando then covered the final stage of the departure from H.M.S. " Striker," while the Union Jack

was lowered at 12.38 p.m. and the G.O.C. took leave of H.M. Consul-General and the United States Senior Consular officers.

At 12.40 the G.O.C. descended the Port Office steps, the last British soldier to leave Palestine, while a salute of 15 guns was fired by H.M.S. " Phoebe."

The motley collection of craft in the anchorage—liners, L.S.T.s and " Z " craft, then set off for their new destinations under the direction of the Royal Navy. As H.M.S. " Phoebe " with the G.O.C. aboard was preparing to leave, sixteen aircraft from H.M.S. " Triumph " flew by in salute in perfect formation, followed shortly afterwards by the last four aircraft of the R.A.F. patrol. As H.M.S. " Phoebe " steamed out for Port Said, the two destroyers and the frigate which had preceded her in line ahead, altered course 180 degrees and steamed by, while the ships' companies each gave three cheers for Lieut.-General MacMillan.

Thus, with dignity, with precision, without incident and entirely according to plan, ended thirty years of British occupation and of British labours for Palestine.

RECOLLECTIONS OF A STAFF OFFICER: FRANCE 1939-1940

By MUSKETEER

THE writer served as a regimental officer throughout the War of 1914–18, and has since held appointments on all three branches of the Staff. He was at the Staff College just over twenty years ago at the time when " form and system " in writing orders and military papers was taken very seriously, with much insistence on " thinking in terms of the recipient." His object in this paper is to give some idea of the varying problems and conditions which confront a staff officer even in a short campaign, and to add a few brief reflections.

In March, 1939, the writer rejoined his regiment on vacating a " G " appointment overseas, but on mobilization joined the ' A/Q " staff of a division in the B.E.F. and was detailed to take its advanced party to France. This included the G.S.O.2, I.O., D.A.D.M.S. and representatives of brigades, units and services. Landing at Cherbourg on 23rd September, we moved to Sablé to receive and guide units into the surrounding assembly area vacated by the preceding division. A certain amount of organization was necessary, as personnel were arriving from Cherbourg and vehicles by road from St. Nazaire.

When the Division was complete in the assembly area, orders came to send the first reinforcements back to the base depots then in course of formation. But sufficient were to be retained by infantry battalions to bring rifle sections up to a strength of ten instead of seven. The C.-in-C. reported in his first despatch: " The existing War Establishment of an infantry battalion, which was not designed for Continental warfare, has called for modification and I am grateful that my recommendations for an increase have been accepted." It is difficult to comprehend what this establishment was really intended for, or why it was not amended earlier, as infantry officers had received it with dismay and thought the battalion top-heavy.

For the move into the concentration area, the writer again took the advanced party. On arrival at a rendezvous just South of the wretched town of Lens, a staff officer from Corps gave him four hours to billet the Division in a specified area. This was rather a teaser. However, the I.O. was sent off to select Divisional H.Q. in detail, and the French liaison officer was despatched with our clerks to secure a temporary office on the road from Arras, and our billets for the night. That left the writer and G.S.O.2, who went round in a car marking brigade, etc., areas on the map. The job was done to time, but during the tour there came to the writer a vision of Camberley one bright morning. The result was that on the final map two areas appeared marked: " Reserve." A little later brigade billeting parties began to arrive, were stopped at the office and given tracings showing their areas. After a few minor adjustments all was peace, though it was a hard struggle to hold on to the reserve. Soon after the Division had settled in, we were told to take two large Corps or Army units into our area, and were able to do so without disturbing our own units. The lesson is, of course, always to keep a reserve when making a billeting plan.

Just before the Division arrived, we received an administrative instruction from C.R.A.S.C., Corps Troops, not Corps " Q," which ordered the Division to establish and feed itself from Detail Issue Depots. This was too much of a breach of staff duties for a disciple of " form and system "; moreover, as the Divisional R.A.S.C. had been formed on very small cadres, it was essential to practise them in the standard

method. Our C.R.A.S.C. also received a copy of this precious document and was delighted when told to ignore it and, from the time the first pack train arrived, to draw, break bulk and issue in the normal manner.

We spent the Autumn in a dreary mining village North of Lens, our only recreation being a hurried walk along tracks bordered by dripping sugar beet and bounded by a horizon studded with slag heaps and belching chimneys. "A/Q" were in a miner's cottage—office upstairs, clerks downstairs—with just a table and chair each. We used to bang on the floor for the clerks, who had the best of the bargain because the bedrooms still exuded a remarkable effluvia which nothing less than a Burma cheroot would even temporarily exorcize. In December the Division moved up close to the Belgian frontier, with H.Q. in the northern outskirts of Lille. It was very cold.

As the months of the *Sitzkrieg* dragged by, the paper war increased in intensity, partly because we were administering extra formations and units which eventually formed another division, and partly because everything tended more and more to the procedure of peace time. Leave started at Christmas; we reconnoitered a billeting and training area for the Division near St. Pol; every Frenchman who could put in a claim, even for a piece of wood, did so; and, altogether, a distinct savour of 1914–18 was discernible. During all this period we only had the normal three staff officers, plus a series of learners, but luckily still had our peace-time clerks, who toiled nobly in a cold fug.

An administrative instruction for Plan D, received from Corps, consisted of some thirty pages. Thinking in terms of the recipients, the writer reduced the draft Divisional instruction based on it to some three pages. There was one alarm in November, and another in January, in the midst of a very cold spell; this time the Divisional Cavalry moved up to the Belgian frontier.

In February, 1940, the writer was posted to Headquarters, L. of C., at Le Mans, this time on the "G" Staff. Up to then this branch had only consisted of two officers, mainly engaged in Passive Air Defence, and a G.S.O.2, "I," who seems to have been a law unto himself. The policy now was to concentrate on training and staff duties, though there was much to be done in connection with local security and the protection of depots, etc., which were growing in numbers and importance. The installations presented a considerable problem as, in anticipation of air attack, there was much dispersion, and the defence troops consisted only of one Territorial infantry brigade. There was not only sabotage to be prevented; pilfering was rife.

Apart from the supervision of L. of C. troops, there were three training activities. The first was the formation and running of a school to teach officers and N.C.O's of the services the elements of weapon training, interior economy and a modicum of infantry training. The second was the provision of ranges and training facilities for the reinforcement depots in the vicinity of Rouen. The third, in conjunction with G.H.Q., was the reconnaissance of training areas for divisions "out of the line."

There were the usual wrangles over establishments, but one of the things which had to be corrected as quickly as possible was the appalling verbosity of messages and misuse of the degrees of priority. In spite of orders, the abuse of priorities by the services went on until arrangements were made with the Chief Signal Officer for periodical swoops by the "G" Staff on the Signal Office. There is no doubt that officers on the staffs of services must have a knowledge of at least the rudiments of staff duties. Matters improved as the War went on, but this early failure is a reminder or the future.

The Field Security people at this time were a nuisance, and appeared to think they were a kind of *Gestapo*. Mostly civilians in uniform, they had insufficient military knowledge, and produced a great deal of nonsense. To make matters worse, their reports did not come through " G " but went straight to G.H.Q. There were startling repercussions, mostly from the A.G's Branch, and much time was wasted in refuting or disproving fantastic or inapposite statements. The G.O.C. finally addressed G.H.Q. on the subject in what he described as an " immoderate letter," and the system was modified to the extent that all reports had to come through our " G."

As the L. of C. spread from the original ports, and the number of installations increased, two Districts—Northern and Southern—with Headquarters at Rouen and Vitré respectively, were formed. Headquarters, L. of C., remained at the *Bourse* in Le Mans because it did not seem that the " phoney war " could go on much longer, and if Plan D were put into operation we were to move forward to Mantes.

The Spring of 1940, after a terrible Winter, was remarkable even for France, and the *Blitzkrieg* started under ideal conditions. When it opened, the local French did not appear to be particularly moved. But the sentry, who usually lounged at the back door of the Post and Telegraph building opposite with his hands in his pockets, was, we saw, now forced to remove one of them to hold an ancient rifle.

Wherever the writer went, either in the Lille district in the early days or during long tours in the L. of C. area, he never saw French troops training. They lounged about the villages, living in uncomfortable, overcrowded billets, badly turned out and ill-shod. One wondered where the real French Army was, and did not realize at first that pacifism and politics had well-nigh destroyed it. An example of the French attitude at this time occurred when the first delayed-action bombs were dropped by the Germans, and H.Q., L. of C., offered to provide bomb disposal squads to remove or destroy any arriving in our area. One Regional Commander acknowledged this offer by asking us who would pay for the damage!

H.Q., L. of C., actually moved to Mantes, but fortunately only an advanced echelon had been installed when it was decided to return to the old location. At Mantes we had an experience of how rumour and panic spread in the rear areas. One night, probably 15th-16th May, the writer was acting as duty officer; the rest of the " G " Staff were still at Le Mans. We had heard that small parties of German motor-cyclists had reached Laon, but there was no particular " flap " on. At about 2 a.m. the telephone jangled for the umpteenth time, and an agitated voice was heard demanding speech with the G.O.C. It turned out to be the Commander at a port who, when told he was speaking to the G.S.O.1, exclaimed that the Germans were only twelve miles away, and asked permission to destroy what he could and to withdraw to the South. It was obvious that the man was completely demoralized; equally, too, that if the Bosches were only twelve miles distant there would not be time to destroy much. The writer told him very firmly that the Germans were not within 150 miles of his port, that his own District Headquarters was in between, and that on no account (repeat no account) was any destruction or withdrawal to be carried out. This brought a demand that the General should be aroused, which the writer refused to do. Then an A.A. Commander came on the line and begged to be allowed to try and get his secret equipment and mobile guns away. He was ordered not to move anything. The writer reported to the G.O.C. a few hours later, after which the matter was taken over by our A.A.G.

Back in Le Mans " G " and " Q " moved out of the *Bourse* into a small chateau on the outskirts of the town. Anxious days followed, the paper war died down, and

in " G " we did practically everything by message; fortunately the L. of C. Signals were most efficient. Looking at our situation map showing the " bulge " we marvelled that the counter-offensive from the South, which could have been so deadly, did not come. We still had visions of another Marne and had not even then realized the extent of the *malaise militaire* which had gripped our Allies, and we suffered from a sense of frustration in spite of efforts to organize some defence of the L. of C.

An improvised division was formed in Northern District consisting of the L. of C. infantry brigade and two others, one composed of reinforcements and another of reservists serving with the Pioneers. The Artillery consisted of a few 18-pdrs. and 2-pdr. anti-tank guns manned by reinforcements and leave personnel; the Sapper component was formed from Army Troops Companies R.E. The R.A.S.C. managed to produce some transport, but there were no medical units. Ordnance depots were scraped to equip the units, but the actual order for the formation occupied one page of foolscap. This force did quite good service between the Rivers Somme and Seine and kept up some sort of resistance almost to the end, but it was not very mobile and could not be ranked as a division.

Getting about became more and more difficult—driving to Rouen was a battle against uncontrolled refugee traffic, mostly Belgian. A visit to *Grand Quartier Général*, via Paris, showed every road South and West of the capital choked with a slowly moving stream consisting mostly of ancient cars and peasants with huge wains, filled with chattels and drawn by weary plough horses. The atmosphere in the purlieus of G.Q.G. had to be experienced to be believed. Meanwhile, missions multiplied, and so did confusion.

The final break between the forward area and the L. of C. took place at Abbeville on 21st May, and hearing no more from G.H.Q., we felt very much alone. Ole Luke Oie's story, " The Joint in the Harness," came back to one. There were the dead ammunition and supply trains waiting on the sidings, as in the story, but there were also long M.T. convoys, organized by our " Q," parked and waiting a chance to get through. Hope that the newly arrived Armoured Division might clear the way soon faded. In the event it was without Infantry, short of essential spares, and not properly supported by the French. The 51st Division had not yet detrained from the Saar.

At this time we strove to get air support for these two divisions but with very little success. What we did obtain was owing to the Army Liaison Officers at Advanced H.Q., B.A.A.F., to whom we were also indebted for most of the information on which our situation map was based. It may be imagined we were not impressed by the bombing of Essen and Hamm by the R.A.F. during this merry month of May. We envied the Navy who, fortunately for England, had secured control of their air arm. Much lip service has been paid to the principles of economy of force and concentration. Never, perhaps, have they been so flouted as by the Allies in this six weeks' war.

The reactions of various people to the conditions then existing were of considerable interest; some of the staff remained outwardly the same, others became excited or quite useless. Although in ill-health, the G.O.C., who was a brilliant soldier, set an example to all. His burden of responsibility was a heavy one, but he remained unruffled right to the end and was a delightful master to staff officers who knew their business and kept their heads. Unfortunately he died suddenly soon after we reached England.

After Dunkirk, a new B.E.F., led by the 52nd Division, began to disembark at Cherbourg, and was ordered by H.Q., L. of C., to concentrate in the Laval-Sablé

area; the same one used by the original force. We remembered to provide them with the right maps, of which they had none, and to warn them to be prepared for all-round defence in any position they took up. The G.O.C., 52nd Division, told "G" Branch they were the first sane men he had met for many days; we felt highly complimented and our morale rose accordingly. But soon after this the telephone shrilled and the G.S.O.2 answered it. "The War Office want to know," he said, "why we are concentrating the new divisions so far back? Why not in the Evreux area?" The writer pointed to the situation map and uttered a few naughty words. "Tell them," he answered, "to read Moltke's project for 1870!" This the G.S.O.2 did.

The new divisions did not stay long—general collapse was setting in. We had tried to help 51st Division North of the Seine by keeping the ferries below Rouen working until the last minute, hoping their guns and transport would get out that way; but they did not. The 52nd Division moved back and re-embarked at Cherbourg.

On 13th June our friends the liaison officers at B.A.A.F. warned us the end was near, and soon after an English girl's voice on the telephone announced: "Table A is closing down now. Good-bye." Then the line went dead and the writer looked up to find the Chief Signal Officer in the room. He was able to give the reassuring news that our own transport was waiting outside the building to take the operators away. We had been very worried about these girls at the section of the Paris telephone exchange reserved for the B.E.F., known as Table A; but it had been arranged to keep it open as long as possible. Paris was occupied the next day.

Every effort had been made for some time to evacuate valuable stores and ammunition. This had ceased for a time because of the new B.E.F., but it was now resumed, and much of the ammunition was got away and the stocks of 100-octane petrol were burnt. Large quantities of supplies were left behind; the writer was informed that the reserve depots were not to be destroyed as the contents were to be handed over to the French.

At last H.Q., L. of C., began to thin out and go back. On the night 14th-15th June, we moved to Vitré, then on to Redon where all papers except the War Diaries were burnt. On the last day L. of C. Signals destroyed their remaining teleprinters. They had kept us in touch with our subordinate formations right to the end, and one could not wish to meet a better unit. During this period our rearguard consisted of a few officers, armed with rifles and mounted on motor-cycles. The remnants of a group we had formed for reconnaissance and liaison purposes in May, they did excellent service throughout.

On 17th June the writer bade farewell to the French liaison officers who had served us well. They formed the most depressed audience he has ever had to address, and did not respond to an assurance that while the Navy held the sea we would fight on.

The writer embarked at Brest—taking the War Diaries and the secret drum of the cipher machine. The ship, one of the last to leave, was an old West African trader smelling mightily of palm oil and cocoa beans. A Brigadier of the Armoured Division assumed the duties of O.C. Troops, and the writer became ship's Adjutant. There were on board detachments of the Armoured Division, who behaved very well, a Canadian unit who did the opposite, the last of the stevedores from Brest, who had worked to the end—Cockney boys these—and an R.A.S.C. unit owning a small band. Late in the afternoon masses of R.A.F.—sheep without shepherds—arrived, and were crowded into the holds. By the time we sailed there were at least 4,000 men on board.

The ship had difficulty in clearing her berth as no tugs were functioning but getting under way at last, glided slowly past the destroyer waiting alongside the quay to take off the embarkation and naval demolition parties. The band suddenly broke into " Rule Britannia," and the ship heeled over as the troops crowded to one side, their cheers echoing round the harbour. Thomas Atkins always seems to appreciate the Navy and to have some idea of the significance of sea power.

Plodding at a bare nine knots, the old ship took twenty-four hours to reach Falmouth, whose people could not do enough for us. There, the writer had his first night's rest for about a month.

In conclusion the writer would emphasize a few points. First, that after eighteen years as a regimental officer and commander, two years at the Staff College, and twelve years on the Staff, he is convinced that a staff officer should be first and foremost a good regimental officer. Second, that a good knowledge of the regulations and normal system for any activity is essential as a sound basis for improvisation when that is necessary. Third, that staff officers must be able to work long hours for extended periods with very little exercise, but it is a mistake to sit in the office just for the sake of being there. Finally, that a staff officer, especially in times of crisis or danger, must be able to put aside personal hopes and fears and so control his emotions that he is able to concentrate fully on the task in hand. If not he is useless.

REGIMENTAL TRANSPORT

By Lieut.-Colonel F. Jebens, O.B.E., *late* The South Lancashire Regiment

SIX years of war have so accustomed us to Mechanical Transport, that it is very easy to forget how comparatively recent was its introduction into the combatant arms. It was as late as 1927 that the writer attended manœuvres in Southern Command in which the first experimental armoured and mechanized units took part. So we shall not be far wrong if we say that " user " experience of Regimental M.T. was limited to the ten years preceding the Second World War.

During that period full use was made of the commercial vehicle industry to evolve the most suitable type of truck, and the outbreak of war found the Army employing vehicles made by Morris, Ford, Bedford and Austin. The advent of Lease-Lend and America's entry into the war added to the number of types issued to units. As the result of these circumstances no single standard design of load carrier was ever decided upon, with the consequence that the supply of vehicles, replacements and spares has been a complicated business, uneconomical in cost, labour and administrative effort.

It is the object of this paper to examine the situation and to suggest a remedy. First let us tabulate the characteristics essential to a unit load carrier :—

(i) The Regimental Transport as a whole must be capable of carrying the entire equipment and stores of the unit in one " lift."

(ii) It must be capable of accompanying the unit on moves made by road, rail, water and air.

(iii) It must be capable of distributing its loads without wasting space or power, so that small sub-units such as troops and platoons can be detached complete with their equipment and stores.

(iv) It must be easy to maintain, and vehicles and spare parts must be standard.

It is contended that Regimental Transport as at present constituted falls far short of all these requirements except the first. Our vehicles are certainly road-worthy but when they are loaded on to a train or stowed in a ship they are unnecessarily bulky and heavy. They occupy space which is badly needed and reduce the useful weight which can be carried. That they are totally unsuited to transport by air is proved by the fact that an entirely different type of transport had to be produced for airborne divisions.

When it comes to distributing loads so that troops and platoons can move as self-contained units, the carrying capacity of the 15-cwt. truck has been proved adequate in war. The three-ton lorry, however, is much too large. As far as Infantry are concerned, there is no single item of store so bulky or heavy that it cannot be carried in a 15-cwt. truck. This probably also applies to other arms with the exception of certain technical stores and plant carried by R.E. and R.E.M.E. units. In order to achieve standardization, therefore, we must aim at the introduction of a single power-unit and a single load-carrier not exceeding 15 cwt. in capacity.

Let us now consider commercial practice to see what we can learn from this. Conventional lorries still form the majority of commerical load-carrying vehicles. They are used by manufacturers and distributors and also to a rather less extent by haulage firms, but the functions of these establishments are more analogous with

those of the services than with those of combatant units. The latter are self-contained mobile organizations. Their parallel in civil life is nearer that of a large family who have constantly to move house than that of a firm—moreover, a family that may have to move short or long distances by road, rail, water or air, or even a combination of all these methods of travel. It is therefore to the removal contractors that we must look for our lessons.

The Container

Now any large firm such as Pickfords, for instance, in tackling the problem would almost certainly not provide conventional lorries for the job, but would carry it out by providing containers suitable for loading on to trucks, trains or ships. The advantages of this type of transport are many. Their contents need never be disturbed during the journey whether by road, rail or sea. The motive power is not locked up during loading or parking. Since they have no powered chassis, they can be constructed to a lighter design which will make them more easily handled and will also reduce the " non-paying " load.

We conclude therefore that the container system is that which is most suited for Regimental Transport. Naturally, the commercial removal container is not exactly what we require, so we will go into rather more detail.

The capacity of the container should be that of the 15-cwt. truck. Its chief difference from the commercial type is that it must have wheels, for we should obviously be worse off if we had to provide flat trucks to carry it. It must, in fact, be a trailer. The absence of driven wheels will enable it to be designed with less ground clearance than is essential in a Service truck, and this will enable its overall height to be kept lower. For the same reason its chassis will not be subjected to such strains and therefore its weight can be kept down.

As we intend to replace the existing three-tonners (as well as the 15-cwts.) with these vehicles, it follows that we shall require roughly four in the place of each lorry. But this does not necessitate four times as many towing vehicles. Experience with airborne divisions has proved that it is perfectly feasible for one tug to tow two trailers. Therefore we need no more than double the number of power units.

The trailers must be sufficiently roadworthy to accompany an M.T. column by road over long distances, and we must be prepared for speeds greater than those to which we grew accustomed in World War II. An efficient braking system must therefore be designed. It is possible that the " over run " brake fitted to modern trailers of considerable weight might prove adequate to control two 15-cwt. trailers towing in tandem. If not, it should not be difficult to design a hydraulic brake actuated by the pedal on the towing vehicle.

Another essential is that the trailers must follow the track of the tug around corners. This means that the trailers must have only two wheels, but presents no difficulty in view of our limitation on their load carrying capacity.

One of the great disadvantages of a trailer is its lack of manœuvre in a confined space. Anyone who has had to park one by the conventional method of reversing will know how difficult it is. With two trailers, reversing is probably out of the question. Since the trailers are relatively small, they could, of course, be unhooked and man-handled. But a better solution would be to fit a short tow bar to the rear of each trailer. The tug could then be driven round to tow it into position backwards. An added advantage of such a system is that it could be used in case of emergency to get out of difficulty.

The Towing Vehicle

The towing vehicle must be small, powerful and fitted with four-wheel drive. It must also be designed to carry at least two men including the driver with their kit and weapons. Experience with airborne divisions proved that the Jeep is capable of towing a load up to and including a 25-pdr. gun under service conditions. Such a vehicle therefore is eminently suited to our purpose. An improved vehicle of this type, the Landrover, is now being produced in this country. It is true that the number of vehicles required is greater than the number of chassis now on the establishment (i.e., one for every 15-cwt. and two for each three-tonner). This disadvantage is however offset by the fact that these vehicles will not be irrevocably tied to their load carriers. When not actually required for towing, they will be available for other work. Also their power can easily be switched from one load to another. They are so easily stowed on other forms of transport that it is doubtful whether they, with their trailers, will occupy more space than the present transport of a unit.

Supply, Replacements and Spares

The ideal to aim at is a tug and trailer of a single design, so that replacements and spares will serve for any unit of a field force. So long as the Army is at peace strength such an ideal should be fairly easy to achieve because it is probably within the capability of any of the larger motor manufacturers to supply the needs of the whole Army. Unfortunately it is far more important that standardization should be present under war conditions, and this is just where our system has broken down in the past. As soon as the Army mobilizes and starts to expand for war, no single firm or even group of firms can supply the entire mechanical needs of the Service. Consequently we have been supplied in the past with, admittedly, a fairly standardized load-carrier, but one which may have a chassis built by one of a dozen different makers. In the interests of economy and efficiency such a system must be replaced.

It is contended that this can be done without undue dislocation of industry provided that there is adequate co-operation between the War Office, the civil department concerned, and the motor industry. The first step is to decide upon the detailed design of both the tug and the trailer, keeping as near to commercial design as possible. The next is to arrange with the requisite number of makers for the production of vehicles in such quantities as to give each maker who will be needed to produce them in war an adequate share of the peace-time requirements of the Army. Thus none of these firms will have the necessary jigs and tools left completely idle in peace. Undoubtedly this portion of their plant will be run at a loss to the makers, but it is considered that this fact must be tolerated in the national interest. If this is done, the outbreak of war will find the leading mass production firms already in possession of a number of the jigs and a percentage of their staff acquainted with the vehicles. Expansion of output to meet war-time needs should therefore be very much quicker than in the past, and the Army should continue to be issued with a single type of vehicle.

If the Army demands such a sacrifice on the part of the trade, the latter has also a claim on the Army. Those responsible for specifications must exercise self-restraint in the matters of design and modifications. Luckily the motor vehicle has reached such a stage of development that major re-design is unlikely for some years to come. There must be no hankering after perfection. The aim must be to select

a sound, sturdy design which is easy to produce and to maintain and well up to the work required. Decision should not be delayed to "wait for next year's model." In the past we have been too prone to design a Rolls Royce to do the work of a Ford.

Modifications are one of the most exasperating headaches of the makers. One only has to read the story of the production of the tank and, more recently, of aircraft, to realize the delay which may be occasioned to production by constant demands for modifications, even where these are only minor. Luckily we are not dealing with a very complicated equipment and there will not be the same temptation to introduce modifications. But demands will undoubtedly arise for them when the vehicles get into the hands of the users, if not before. It is almost inconceivable that the minor details of such a vehicle should be equally satisfactory for all arms. For this reason it is suggested that the standard vehicle should be delivered by the makers to the Army as it was originally designed and that any modifications necessary be carried out in R.A.O.C. and R.E.M.E. workshops, who will be in closer touch with the detailed needs of the users than the makers.

Conclusion

To sum up, it is contended that the Regimental Transport of the Army should be reorganized on the basis of the towing vehicle and its trailer; that the latter should have a load-carrying capacity not exceeding 15 cwts.; that there should only be one standard design for both these vehicles; and that such a system would lead to economy of material, labour and administration which would be of the greatest benefit.

A PIONEER IN NAVAL AMENITIES—SIR JOHN DALRYMPLE

By Commander (S) J. P. Gillespie, R.N.

THE last days of many reformers are often gladdened by the knowledge that the ideas they put forward have in the end been accepted by mankind. Sir John Dalrymple was not so fortunate, and of his plans for introducing laundries into ships and for the brewing of beer at sea only the former has to date been accepted by the Admiralty for fitting into all ships, including destroyers and submarines. The production of beer at sea, however, though worked on a different principle from that advocated by Sir John, was used with success on board H.M.S. "Menestheus" during the 1939–45 War.

A Washing Installation

It was in 1808 that Sir John Dalrymple, at one time Baron of Exchequer in Scotland, published his three addresses,[1] by which he hoped to introduce his two reforms, one of which he considered would be of more benefit to seamen than any discovery since the mariners' compass. This reform was the installation of washing by steam on board ships instead of using rubbers as was then the custom. The necessary apparatus consisted of a cask, which had to be completely smooth inside, made of fir or any non-astringent wood. An axle was fitted to each end of the cask so that it could be rotated by a handle which was fixed at one end. At the other end a pipe from the ship's copper was led through the axle and steam could thus be fed into the cask. About two inches from the inner end of this pipe a grid was fitted inside the cask in order to prevent the articles being washed from fouling the steam inlet. A close-fitting lid, which could be secured by a screw, was fixed to a hole on the side of the cask, through which the clothes to be washed could be inserted. The cost of producing such a machine was estimated to be £1 7s. 6d.—considerably cheaper than any washing machine produced to-day.

Sir John states that Admiral Schank informed him that at that time "the common way to wash in a ship is to spread the substances to be washed on the deck, put soap upon them, water the soap and rub them hard with rubbers upon the deck." This method was stated to have three bad effects: "first, it wastes much of the soap which sticks to the raiments; secondly, the rubber tears the raiments; thirdly, and worst of all, the soap remaining in the raiments makes them clammy and stops the perspiration of the wearer."

His own method was to take 2½ lbs. of soap and 8 oz. of potash for every one hundred garments and then add three gallons of fresh water for every dozen articles. The garments were then soaked in this solution for one hour, slightly squeezed and put into the cask; steam was then admitted and the cask was rotated by the handle for one and a half hours, after which time steam was shut off and the clothes were rinsed twice in salt water. They were then put back into the cask and steamed for half an hour to destroy any salt that remained from the rinsing.

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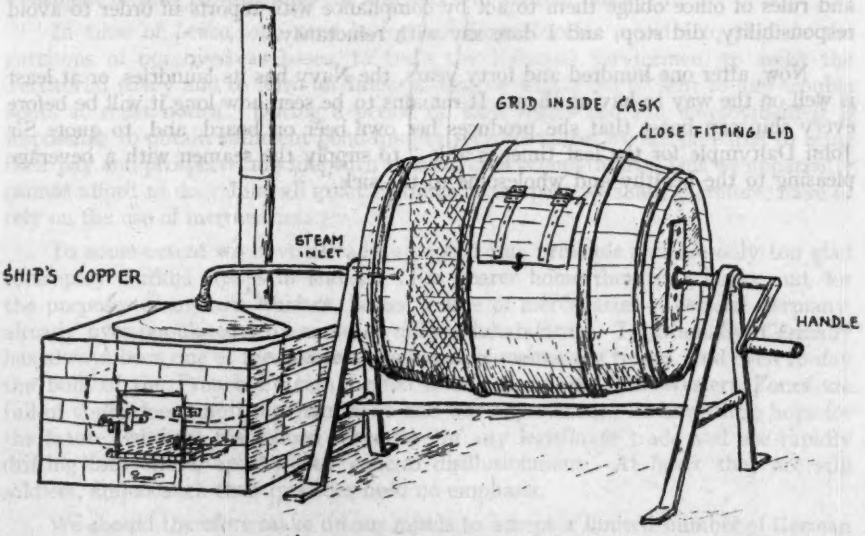
[1] *Three addresses by Sir John Dalrymple, Baronet, lately Baron of Exchequer in Scotland, to the Seamen, Soldiers and Great Mass of the People of England, Scotland and Ireland*—printed in Edinburgh by J. Robertson, No. 4, Horse-Wynd, 1808.

Sir John Dalrymple claimed that the three bad effects mentioned by Admiral Schank were obviated by his system and went so far as to communicate his ideas to " Lord Melville, the head of the Admiralty, because he loves to be called the seamen's friend and would therefore share in their happiness "—always assuming that his scheme would be adopted. Demonstrations were arranged for the Victualling and Sick Boards and also for the East India Boards, but there is unfortunately no information as to the result of such trials.

The Second address is to " the brave and generous soldiers of England, Scotland and Ireland " and applies the principles described in the first address to the washing of clothes on land.

To the advantages of his method outlined above, Sir John Dalrymple adds one of national savings in the event of his scheme being applied ashore. He estimated that there were 15 million people in England, Scotland and Ireland and that on the average they each washed three shirts in every two weeks. The cost of the methods then in use he worked out to be one shilling per dozen shirts, whereas by his method this would be reduced to fivepence a dozen—a saving, according to his calculations, of £4,875,000 os. od. per annum!



SIR JOHN DALRYMPLE'S APPARATUS FOR WASHING CLOTHES BY STEAM

Brewing of Beer at Sea

The third and last address concerns seamen again, and describes a system for the brewing of beer at sea in all climates, using cold water and the common casks of the ship instead of the special apparatus of a brewery.

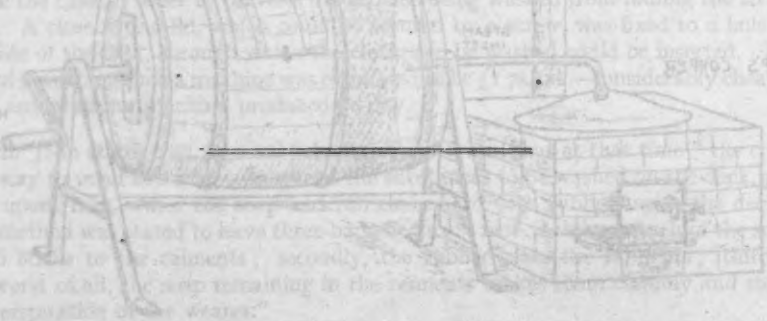
Commencing his remarks with a reference to Captain Cook who, he states, lost only one man from disease in a voyage of three years and thirteen days, Sir John goes on to an address given to the Royal Society by Sir John Pringle, in which this was ascribed to the use of malt from which worts were made. He continues, " the reason why worts are so wholesome at sea is that they contain a quantity of gas, or

what is called fixed air. But worts do not contain one-fourth part of the fixed air that is in beer, because the fermentation in beer is both the creator and creature of fixed air. On which account Sir John Pringle and all Navy people agree that the seamen never lose their health as long as the beer lasts."

Sir John carried out experiments and succeeded in producing a beer in the manner outlined above, which was examined by Mr. Younger of Edinburgh, Mr. Whitbread of London, and also by the King's Second Brewer at Wapping, who made a declaration to the Victualling Board that the beer " was near as good as the King's."

The Admiralty were informed and specimens were sent to three ships for report According to Sir John, two failed to render any report, but Admiral Lord Duncan, in his report, stated that " it was an exceeding good substitute when the King's beer was run out." However, it was decided not to make use of the idea, firstly because of an adverse report from an unnamed Admiral in the West Indies, and secondly because " the physicians gave an opinion that lemon juice was more healthy for the sick than the essence of malt." This latter statement stung Sir John to reply that it was not for the sick alone that he wanted his beer to be used—but to preserve the health of all. Because of these two opinions the author states that " the Admiralty, whose forms and rules of office oblige them to act by compliance with reports in order to avoid responsibility, did stop, and I dare say with reluctancy."

Now, after one hundred and forty years, the Navy has its laundries, or at least is well on the way to having them. It remains to be seen how long it will be before every ship can boast that she produces her own beer on board, and, to quote Sir John Dalrymple for the last time, is able " to supply the seamen with a beverage pleasing to the healthy and wholesome to the sick."



MERCENARIES

By Lieut.-Colonel M. St. J. Oswald, D.S.O., M.C., R.A.

In peace-time the two greatest handicaps under which the British Army labours are financial stringency and shortage of manpower. In any future war the purse strings will again be loosened but lack of numbers will be felt more acutely than ever. More men than in the past will have to be retained in essential industry in order to supply the Services with their needs, while the anti-aircraft defence of this Country may well make even greater inroads into our available manpower. Furthermore, we can no longer rely on Indian troops being used outside the frontiers of their own country.

In the last two wars France was able to mobilize a large army which, at least at the outset, kept the enemy at a distance from the English Channel. That she will be able to repeat this in future is doubtful. Our only substantial Ally, the United States, is on the far side of the Atlantic and, however prompt the intervention of her air and naval forces, she cannot be expected to deploy her Army on the Continent in time to withstand the first shock of another onslaught.

In time of peace, our need is for sufficient Regular recruits to provide the garrisons of our overseas bases, to train the National Servicemen, to assist the Territorial Army and to form an Imperial reserve which can be sent to any trouble spots at short notice. During a period of high wages and full employment it is impossible to obtain sufficient good quality recruits unless we are prepared to bring their pay and prospects into line with those in civil occupations. This we apparently cannot afford to do. Like all great Empires in the past we shall, therefore, have to rely on the use of mercenaries.

To some extent we have already accepted this principle and are only too glad to employ Gurkha troops in Malaya. Far nearer home there is a larger and, for the purposes of modern warfare, better source of mercenaries—Western Germany, already over-populated with some 40 million inhabitants. Traditionally, Germany has always been one of the greatest producers of mercenary troops, and even to-day the bulk of the French Foreign Legion is still German. The Western Zones are full of young men, most of whom have had war experience, who have little hope for the future, who are disinclined to engage in any legitimate trade and are rapidly drifting into crime, apathy and general disillusionment. At heart they are still soldiers, and as such their qualities need no emphasis.

We should therefore make up our minds to accept a limited number of German recruits into the Regular Army. That these recruits would be forthcoming is not in doubt, provided the terms of service are reasonable and are given good publicity. None of the occupying Powers could be described as popular but, of the four, Great Britain still probably retains the greatest degree of respect amongst the Germans, who would, if given the choice, prefer to enlist in the British Army rather than in any other. Our only rival in this respect is America, who in any case has all the manpower she needs. The number of volunteers would in fact be so large that we could afford to pick and choose and thus ensure that the quality was of the highest.

The advantages of adopting this proposal are that it would

(*a*) save British manpower;

(*b*) overcome the shortage of Regular recruits;

(*c*) raise the standard of recruits by importing a nucleus of high-class professional soldiers ;

(*d*) help to link the British Zone and indeed Germany (for recruits would come from all Zones) more closely with Britain. The returning soldier would be a far more potent advertisement for the British way of life than all our present efforts at re-educating Germany ;

(*e*) establish a connection between Germans and the British Army. Germany by herself cannot be a threat to the peace of the World for many years to come. In any future war, however, German manpower will be used by one side or the other. The advantage of accustoming Germans to service in the British Army far outweighs the risk that we should be training soldiers who may one day be used against us.

The main objection to this scheme is that it might lead to protests from those countries which fear the rebirth of a powerful Germany and thereby weaken the unity of the Western *bloc*. In order to overcome the fears of our Allies we should not only stress the obvious advantages of such recruiting, but should also give an undertaking that in peace-time Germans would only be used in limited numbers as individuals and not as formations, and then only in the United Kingdom or in overseas garrisons outside Europe. France, who is actively recruiting Germans for her Foreign Legion, would in any case have little cause for complaint.

The reaction of Russia and her satellites would no doubt be violent, but should be ignored since, compared with the blockade of Berlin, such recruiting could scarcely be considered a hostile act. There are also good reasons to suppose that the von Paulus army is still in existence, nor has any satisfactory explanation ever been given as to the discrepancy between the number of German prisoners who fell into Russian hands and the number she is prepared to return.

Public opinion at home should be won over to this proposal by emphasizing the resulting advantages to Britain, the great opportunity presented for re-educating Germany and the contribution which the youth of Germany would make, by enlisting in the British Army, to the preservation of peace in a world which was shattered by German aggression.

Terms of Service

In Western Germany the scheme should be initiated by a carefully-prepared publicity campaign giving the terms of service and the obligations of the recruit. Briefly these should be :—

(*a*) Engagement for five or six years outside Germany of which approximately half would be spent in the United Kingdom and the rest overseas. Re-engagement up to a maximum of 21 years service would be permissible.

(*b*) The same rates of pay, allowances and pension as the British Regular soldier.

(*c*) Promotion up to and including the rank of Warrant Officer. The question of promotion to Officer rank could be reconsidered after the scheme had been in operation for a few years.

(*d*) Normal leave to Germany while serving in the United Kingdom.

(*e*) Married quarters in the United Kingdom on the same scale as for the British Regular soldier but only after completing say three years service, i.e., after initial training and a tour of overseas service.

(*f*) The recruit would be required to take an oath of allegiance on condition that he would not be used to fight against his own country.

(*g*) After completing his colour service, the German would still have a reserve liability.

(*h*) He would retain his German nationality but could apply for British nationality before the end of his colour service. His acceptance would depend on his character and the quality of his service. (This in itself would be a great incentive to recruiting.)

The Scheme in Practice

Prospective recruits would apply to the nearest British Military Government Headquarters, where they would fill up a form giving personal details, age, previous service and so on, and hand in a medical certificate from a German doctor. Investigations would be made into their past in order to weed out Communist sympathizers, certain categories of ex-Nazis or those with a criminal record. The rest would be called up for interview and if passed would be directed to selection units in the British Zone.

The number of such units would depend on how many recruits we are prepared to accept. Until the experiment has justified itself, we should set a limit of, say 6,000 in the first year or a monthly intake of 500, for which one selection unit would be sufficient. Here the process of grading recruits according to their fitness for various Arms and for specialized training within those Arms would take longer than the normal procedure at home. A month instead of a fortnight should be allowed, and this would also give time both for the recruit to become accustomed to British methods and to make certain that all undesirables were rejected before leaving Germany.

After passing through the selection unit, the recruit would join the monthly draft for the United Kingdom, where he would be sent to a Basic Training Unit of his particular arm. Thereafter he would be treated in exactly the same manner as a British Regular soldier, except that his overseas tour of two-and-a-half or three years would be spent in the Middle or Far East and not on the Continent. At the end of this time he would return to Britain, a fully-trained and experienced soldier and, being by now completely anglicized, would be able to play his part in training the National Serviceman and in assisting the Territorial Army. He should be allowed leave to Germany and, if married, might bring his wife and family to Britain for the remaining period of his colour service.

On taking his discharge and returning to Germany, he would be still liable to call up as a reservist. This would be difficult to enforce, particularly if the man's home was not in the British Zone. We should, however, take steps to retain his loyalty after discharge by seeing that he obtained good employment, possibly working for British Military Government, and that units in B.A.O.R. arranged periodic reunions for German reservists. This, combined with the average German's fear and hatred of Russia, would ensure that his services were available when required.

THE WORLD SITUATION THROUGH RUSSIAN EYES

By Major D. G. B. Boyd, R.E.

IN *Blueprint for World Conquest** the programme of the Communist International, as adopted by the Sixth World Congress on 1st September, 1928, at Moscow, is set out in exact translation. It remains to-day the unvarying programme of World Communism, and the introduction of the Cominform at Belgrade is merely a means of its extension.

Careful study of this document reveals that no mention is made in any part of it to aggressive military war initiated by the U.S.S.R. Instead, the emphasis is always on the defence of the U.S.S.R. against an expected "capitalistic" attack. Such an attack is recognized as being extremely formidable, owing to the military power of the capitalistic States. The theme throughout appears to be two-fold. First, and above all else, comes defence: the U.S.S.R. is recognized as "the only fatherland of the *international* proletariat, the principal bulwark of its achievements, and the most important factor for its international emancipation; the *international* proletariat must for its part facilitate the success of the work of socialist construction in the U.S.S.R., and defend her against the *attacks* of capitalistic Powers by all possible means . . . ." Thus, as a corollary, if Russia is attacked by the capitalistic Powers the communist parties inside these capitalistic and imperial States must co-operate with the proletariat inside the U.S.S.R., in destroying the capitalistic Power to wage war by the use of strikes, boycotts and finally, internal revolution, in order to produce a communist State and thus promote the expansion of world communism.

The two factors leading to eventual world domination are an invincible hard nucleus of highly organized and disciplined communism within the U.S.S.R., and the steady strengthening of communist parties in capitalistic and social-democratic countries and their colonies and dependencies, so that when strong enough, these communist parties, by legal methods, can seize power in the capitalistic Parliaments and then convert the countries to communist States. The object of this paper is to examine the growth of power in the U.S.S.R., and to attempt to forecast her means and chances of achieving such world domination.

Up to 1933 the programme as set out in 1928 progressed on a relatively even keel. The U.S.S.R. was rapidly arming herself for her own protection against the capitalistic Powers, particularly Great Britain, France and Japan; and she had good reason to believe that against the two former she had by then achieved a reasonable state of defence; she had the greatest army and air force in Europe, and in the Far East she was capable of building up sufficient defensive strength to deter Japan from adventures other than in China. A long struggle lay ahead, but the hard central core had been created, and the communist parties in capitalistic countries were gaining strength. She was using the League of Nations to improve their position, and to dupe the Western World into believing that she was co-operating for peace and stability.

Then the scene changed. Suddenly, and at increasing tempo, Germany, Italy and Japan began to arm for an imperialistic war, aiming at world domination, to be achieved by force of arms. As a result, the nucleus in Russia, far from being secure from the West or the East, was rapidly becoming in danger of being destroyed by the nations of the anti-comintern pact in their pursuit of world domination. So the

* *Blueprint for World Conquest*, as outlined by the Communist International. Published by Human Events, Inc., Washington, Chicago. 1946.

emphasis changed to greater defence of the nucleus, and the communist parties in capitalistic countries were left to get on as best they could. This state of affairs continued until 1945, when the U.S.S.R. found herself in possession of Eastern and Central Europe, and with control over the former Japanese dominated areas of Northern China and the Kuriles.

To the U.S.S.R. the situation in the Spring of 1945 must have seemed very similar to that in 1933. The inner nucleus of the U.S.S.R. though terribly weakened by the German invasion and the retreat from Moscow and Stalingrad, was secure, and the occupation of the satellite countries from Northern Korea to Yugoslavia and Poland, provided a cushion behind which the nucleus could be built up to produce the required hard impregnable bastion from which outside communist parties could derive their strength and funds. But there was one great and unexpected difference from 1933 : the U.S.A., having become a great world Power, was equally fanatically determined to oppose the spread of communism in all capitalistic countries by substituting her democratic conception of the four freedoms, and was evidently prepared to support that policy by generous gifts of dollars, food, industrial equipment and raw materials. By 1948 it was apparent that the U.S.A. was considering the employment of military power to prevent the countries she was aiding being overrun by the Soviet armed forces, which were in a position of unchallengeable strength in the vicinity of those she was supporting. The change was unexpected because up to 1945 Russia had imagined that, though weakened internally, her territorial gains in Europe and Asia, and her mobilized armies and air-forces *vis-à-vis* American and British demobilizing armed forces, could adequately maintain the *status quo*, giving her breathing space to rebuild her industrial power to support conventional weapons. This conception was rudely shattered by the first atom bomb on Hiroshima.

The atom bomb changed everything. It was a well-kept secret, and its very existence caused consternation in Russian circles at Potsdam. Its arrival caused a hurried review of Soviet policy. No longer was the nucleus secure. Long-range American bombers carrying atom bombs could threaten the heart of the nucleus from Western Germany, Austria, Italy, perhaps Turkey, the Middle East and India. Far from being secure, the hard core of communism suddenly appeared to be horribly vulnerable. What then was to be done to further the aims of Soviet Policy outlined in 1928 ? The first thing to be attended to was, once again, defence : essentially anti-aircraft and fighter defence for the centres of industry, and to pursue a policy of limited expansion in order to extend the range of American bombers. As regards the latter, four areas appeared to offer chances of *fait-accompli* action, without precipitating a general war, but if a general war would be caused by such action, then it should not be pushed to the limit.

The first of these areas was Germany and Austria. The plan is clear there : first the elimination of the Western Allies from Berlin and Vienna ; then the creation of a Russian sponsored German and Austrian government ; and finally, if possible, a German and Austrian Peace Treaty requiring the removal of the Western Allies' forces. Von Paulus' army could then look after Germany and Austria for the Russians defensively.

The second area was Italy and Greece. Here were two countries from which American bombers could launch atom bombs. If such an attack were made, perhaps the areas could be rapidly overrun by the Russian armies, but that might be too late to prevent great damage being done. Somehow they must be secured, and the

pattern in Greece was guerilla war against the Greek government with satellite, but not Russian, intervention; and in Italy support for the Communist party in the hope that they might obtain control of the country by parliamentary means. In the teeth of intense Russian pressure all the Soviet objectives in these two areas have so far been checkmated by the Western Powers. Reactions to this western success have been such as to indicate that the above thesis is correct. In fact Russia continues to pursue them to a degree only short of open war.

The third area was the Middle East, particularly Turkey and Persia. Pressure has been brought on both these nations, so far without effect. Further attempts are likely to be made, particularly against Persia, but America and Britain are now vitally interested in the sovereignty of both these countries, and it appears unlikely that they will surrender it to Russia, except by an act of war, and war at present is not the answer to Russia's problem, which is the defence of the nucleus.

The fourth area was the Indian Continent and the territories of South-East Asia and China. Except for Northern China and Korea these areas were too far removed from the centres of Russian military power in 1945 for communist governments to be set up by direct Russian intervention, as in Eastern Europe. The pattern in India and South-East Asia was communist infiltration, considerably aided by the general unrest and outburst of nationalism following the Japanese surrender, leading to rebellion against the established Governments in Burma, Malaya, Indonesia and Viet-Nam. This trend has been or is now in the process of being resisted by the armed forces of the respective colonial Powers, and by the efforts of the independent Burmese Government. Russian military intervention in the closing stages of the Japanese war in Manchuria and Korea paved the way for civil war in China, and it is in this area that communist gains have been most spectacular, though there is some doubt concerning the degree of co-operation between the Chinese Communists and the Kremlin. The main resistance to Soviet expansion in China is American military and economic assistance to Chiang Kai-Shek, American predominating influence in Japan, the Philippines and the Pacific Island bases, and British stability and prosperity in Hong Kong.

The range of modern aircraft is increasing, and about now the Kremlin must be considering whether the originally conceived "cushion" of satellite or occupied states around her borders can prove an adequate buffer to modern strategic bombers. Should Russia occupy areas beyond these countries with her armies, the Western Allies could still strike at her from North Africa, China, Japan, the Pacific Island bases and Britain, and she would not have materially furthered the primary object or the defence of the nucleus. So for the present it appears that she has withdrawn from an attempt at expansion, thus leaving the Western nations to benefit by the Marshall Plan, though making every attempt to sabotage it by communist party action from within. The nucleus is still not secure, and will not be until she has reached parity in the new weapons, and so is able to achieve security by the threat of retaliation. The success of the Eniwetok experiments may have retarded still further the attainment of her primary objective.

The year 1948 should, therefore, close as Russia's most disastrous year since 1928. She is utterly alone, weakened still further by Yugoslavia's defection this Summer, and faces a hostile and potential colossus which is many years advanced in the technological "know-how," skill and industrial organization to support a modern electronic war; moreover, she has a major adversary with adequate money to restore the present weakened western nations to sufficient prosperity to retard

the growth of communism within their borders; for communism only thrives on poverty, hunger, unrest and disorganization. Great Britain, by a wise act of self-determination, has given freedom to India, Pakistan, Ceylon and Burma, and has thus gone some way to neutralize a fertile field of communist infiltration into capitalistic colonies and dependencies by encouraging nationalism and patriotism. The Dutch and French are in the process of pursuing a similar policy in Indonesia and Viet-Nam—both areas of communist infiltration. In the Middle East the Arab nations are trying to achieve, under British benevolence and guidance, their long-desired aim of a true Pan-Arab bloc; while the Jews, assisted by the U.S.A., should secure the reasonable boundaries of a Jewish homeland, perhaps not all that they desire or claim, but at least an area, which by their known ingenuity and energy they can convert into a stabilized prosperous state. The policy of this state, once the borders have been settled, will not be pro-American, pro-British, pro-Russian or pro-Arab, but essentially pro-Jewish. Perhaps the present day (September, 1948) British and American policies will eventually achieve Middle East stability, and thus a bulwark to the expansion of communism.

Russia is in fact just now on the horns of a dilemma. If she uses the Soviet army to expand her present borders she could, it is true, soon reach the Pyrenees and the Atlantic coast, occupy all Scandinavia, dominate the North shore of the Mediterranean, overrun Turkey and Iran, and drive deep into the Arabian Peninsula. But when she has reached these points, it is probable that they represent her limit, and certainly in Arabia, and possibly Spain, she might place herself in a position to be successfully counter-attacked. She would, in fact, have done little to solve the pressing defence of the nucleus. Further she would have performed an act least calculated to achieve the goal of world communism. By attacking capitalistic countries, she would have incited them to resist aggression and given the governments of those countries an opportunity to rally all their people to defend their country with a fanatical patriotism. In the aftermath of attack she would have to cope with a resistance movement such as she herself organized against the German invaders. In fact she could only count on the active co-operation of communists in capitalistic countries if those countries were attacking her. The writer is not saying that this will not occur. He is merely stating that such overt aggression is outside the programme of the Communist International and would do little to achieve its goal.

What then is more likely to occur? It seems that Russia will now consolidate her gains, and give first priority to defence. There will be no change in her policy and world communism will remain the ultimate aim of the men of the Kremlin. She will remain highly mobilized for the next 10–15 years, in order to ensure defence by conventional weapons, until she has developed the atomic bomb and has a large stock pile of them. Then the wheel will have come full circle. Once again the communist parties in the capitalistic, social-democratic countries and their colonies and dependencies will be given the means to extend world communism by internal revolution.

It therefore behoves the Western Nations to organize themselves into economic co-operation and thus prosperity in the next ten years, in order that all their peoples will enjoy such contentment and their colonies and dependencies will have the widest possible measure of self-government or be moving progressively towards it, so that a change to a communist order of things will have no attraction. Surely this is not beyond the scope of human endeavour, working through free institutions?

But there is another aspect. The argument given above indicates that until about 1960 Russia will be striving to achieve her own security. It is probable that she will never achieve both sufficient security at home and sufficient communist party strength abroad for the 1928 dream of world communism to become a reality. She will then have two courses open to her, one to remain static and may be disintegrate into her component nationalities, or alternatively to revert to the traditional Russian imperialism. The traditional Russian imperialism is not world conquest, or anything approaching it; it is a continuous striving for warm water ports and the oil-bearing areas of the Middle East. Both these objectives lie in the Middle East, and it is in this area that her thrust may be made. As her industrial power develops, her meagre oil production (5 per cent. of the World's total) and her proved oil reserves (5 per cent. of the World) will not be sufficient to support it. If she cannot find more oil within her borders, she will have either to acquire it in the adjoining Middle East, or disintegrate. If Russia is to be prevented from overrunning the Middle East, the Americans should assist the British in peace to maintain sufficient forces to ensure its defence, and increase their economic interests in this area. Mutual defensive treaties with the Arab States and Israel would be the logical outcome of this policy.

Logically, therefore, the main objectives of American foreign policy in the future would seem to be :—

(1) To support the Western Nations with the Marshall Plan, and to promote a Western Union, as a bulwark against the spread of world communism.

(2) To promote stability in the Far East by giving military and economic aid to China in order to resist the spread of world communism.

(3) To promote stability in the Middle East by mutual defensive pacts with the British, the Jews, and the Arabs, in order to combat a renewal of Russian imperialism.

(4) When the third objective has been achieved, to ensure that the surplus oil of the Middle East is available for all nations, *including Russia*, and that if necessary Russia has a share in its production.

This, then, is the pattern for world peace, the means of achieving stability, and the only way of containing, and eventually dispersing, the dark clouds of slavery cast across the World since 1917 by the self-appointed tyrants in the Kremlin. It is a policy of mutual defence and co-operation between all nations, including eventually the peaceful Russian people.

The following review is inserted here so that it may be read conveniently in conjunction with the foregoing article.—EDITOR.

War Between Continents. By F. O. Miksche and E. Combaux. (Faber and Faber Ltd.) 15s.

Colonel Miksche has already established himself as a writer on war of outstanding ability. His *Paratroops* contained a remarkable forecast of the Normandy landing and his *Blitzkreig* was another notable production. Now, in collaboration with Colonel Combaux of the French Army, he has written a book which is a masterly summary of the causes and reactions of international tensions to-day and a closely reasoned forecast of the course which the next war is likely to take if diplomacy fails to relax those tensions.

There are five chapters. The first deals with the situation from which the World is suffering as the result of the late war and the insatiable lust for power of the new dictatorship—the " Fourteen Men in the Kremlin," as Mr. Churchill has dubbed them. Of these latter the authors have to say they have " not yet shaken off the numerous troubles which beset a revolutionary government. Representing as it does an abstruse ideology, with an uncertain hold on its people and fierce disapproval from outside, it lives in fear of any force that may oppose itself to its policy."

Russia's foreign policy they define as follows :—

(*a*) In Europe, her aim is to detach (the word appears to be used in its less usual sense—" to free from care ") Leningrad ; to tighten her hold in the Baltic, Germany, Poland, the Danube Basin and so achieve a security zone which will push her frontier as far West of Moscow as possible, and finally to " detach " the Black Sea by means of a Balkan policy which will settle the Straits question to her advantage.

(*b*) In Asia, her object is to create vast defence zones in the Near, Middle and Far East which will act as buffers to the important Caucasian provinces, to the main parts of East Siberia, and to the Pacific coastline.

These projects not only form the pattern of the Kremlin's geographical objectives but also of the probable strategy of a potential war.

But this foreign policy is not governed by purely military considerations. Fundamental to the Soviet's fears and ambitions is the vital need of " a powerful self-supporting industry " and for " ascendancy over vast territories which, in the event of war, would keep hostilities as far as possible from her own frontiers."

In the growing struggle between the forces of peace and war, " the enormous power of industry in the United States and the Dominions will play a decisive part." It is evident that the authors foresee as a menace to peace not only the aggression of Russia, but also the danger of economic collapse in the so-called capitalist countries, notably the United States whose people were " spared the bitter trials which Europe experienced for their sake " and, it is inferred, might too readily be led into war as some form of antidote to rapidly deteriorating economic conditions.

Chapter II deals with the " Friction Areas in World Politics." A simple map illustrates the main friction zones of the World, and these are discussed dispassionately from their political, geographical, economic and military aspects. Many readers will not agree with the low assessment of the military status and capabilities of the British Empire, but this book is no respecter of Powers or personalities and it is never a bad thing to " see ourselves as others see us." Indeed, on balance, we get the impression that Russia and her satellites are thought to be on a better wicket than is generally supposed. Space will not permit of even a summary of the causes of the " Friction Areas " dealt with in this chapter, but it adds considerable detail and colour to the pattern of a possible war, and as such deserves to be studied closely.

" Planetary Strategy "—Chapter III is, perhaps, the most interesting and valuable part of the book. It is, in effect, a forecast of the shape of a war in which Russia, her satellites and " fellow travellers " take the initiative on a grand scale at the outset, and of the tasks confronting the anti-Communist Powers before they could drive her back to her own confines. In Europe, it is assumed, Russia will make for the Atlantic seaboard, over-running France and the Low Countries at once in order to prevent their being used as a base for an Anglo-American offensive against Central Europe and " beyond to the steppes of Russia." Then she would be faced with the same problem as that which confronted Hitler—" whether to invade Britain or to march on Gibraltar and risk a campaign in Spain." Hitler, as we know, did neither ; but the authors think Russia would choose the latter course, particularly as this would be part of her major strategy aiming at outflanking the Mediterranean both in the West and in the East, and ultimately dominating that Sea and North Africa.

A second offensive would be directed against Asia Minor and would include the

occupation of the oil-bearing territories of the Middle East, reaching down to Palestine, Suez and the Red Sea. Elsewhere we are reminded that these oil sources are vital to Russia; without them her forces would soon come to a standstill.

The third offensive would make for India, but beyond expanding a Communist Empire, it is not clear what specific objects this would have in view.

But even if success attended these gigantic operations, it is questioned whether a Russian victory would produce consequences which would "suffice to bring peace." Naval Powers "can always count on taking land Powers by surprise" and the immense resources of the British Empire and the Americas would enable them to fight their way back. So Anglo-Saxon strategy in a counter-offensive is traced for us in equally bold and imaginative outlines, also illustrated by simple large-scale maps. In all of this due weight is given to the part which "fifth column" forces will play, on both sides, in such a world-wide upheaval.

A chapter on "Technique and Tactics" shows that the authors are practical men with a professional knowledge of modern weapons and their potentialities. They show how the enormous increase in striking range, whether of aircraft or guided missiles, affects the geography of strategy, e.g., the importance of Iceland and Newfoundland as launching platforms. Of the atom bomb or other equally dangerous weapons loaded with virus or bacteria, they have to say those responsible for starting such forms of total warfare "may repent later on when they, in turn, become victims of the barbarities which they initiated." They note that Hitler was deterred by that fear from resorting to gas warfare.

Recent American forecasts that a future war would take the form of a quick succession of lightning operations are discounted, and the authors emphasize the dire effects of long-range attacks on invading forces while concentrated at their departure bases, during the sea journey, and while stabilizing their position on arrival. Russian continental defences are visualized as taking the form of "defence redoubts" serving as supporting areas for "guerilla formations" employed in disrupting transport and communications and so isolating detached invading forces. These in turn would be supported by "interception forces"—large armoured, airborne and tactical air force units, behind which would be the bases of the "strategic air force" and, finally, the main defence forces for big industrial centres or areas, radar systems and anti-aircraft organizations.

In the last chapter, as an antidote to the terrors depicted in the others, we have "The Way of Peace." This looks for a European renaissance which, before all things will avoid giving support to either of the rival spheres, in fact a United States of Europe acting as a buffer between the warring ideologies. A start would be made by forming "regional federations," e.g., a western federation consisting of Britain, France and the Benelux Countries; a Scandinavian federation; and a Danubian federation. Here we feel we are being led into the realms of idealism and wishful thinking—pleasant pastures after battlefields, but less profitable for those whose business it is to study how to be ready for the worst in case it should come.

Few will agree with all the arguments, conclusions, and forecasts of this wide appreciation of the World situation; but few of the very many who it is to be hoped will read it, will not agree that it is a brilliant work and a remarkable literary effort in, what is for both the authors, a foreign language.

THE INTERNATIONAL SITUATION

THE UNITED NATIONS ORGANIZATION AND THE BERLIN CRISIS

CONVERSATIONS on the situation in Berlin took place at intervals in Moscow between the three Western envoys and M. Molotov, and dragged on for a period of six weeks. Marshal Stalin was brought into the discussions on 2nd and 23rd August. Eventually a four-Power directive was sent to the Allied Commanders-in-Chief in Germany, instructing them to discuss certain technical matters.

This caused the four Cs.-in-C. and their deputies to meet again on 31st August for the first time since Marshal Sokolovsky had walked out of the Control Council on 20th March. The meetings continued daily until 7th September, when it was obvious that yet another *impasse* had been reached.

Before the end of that month, the Western envoys had further meetings with M. Molotov. Mr. Bevin, Mr. Marshall and M. Schuman subsequently discussed the situation again in Paris. Finally, identical Notes from the three Western Powers were sent to Moscow. In violation of the understanding between the four Powers, the Soviet Government, on 25th September, published their version of the negotiations, including those between the Cs.-in-C., and also what purported to be a reply to the latest three-Power Note. Out of all this diplomatic wrangling certain facts have emerged quite clearly. Many of them were put at great length in a *communiqué* handed to the Soviet Ambassadors in London, Paris, and Washington on 27th September, but the essentials can be summarized as follows :—

1. The three Western Powers are inflexibly determined not to accept any arrangement " which would deny or impair the rights in Berlin acquired by them through the defeat and unconditional surrender of Germany . . . ."

2. Agreement was reached in Moscow on a directive to the Military Governors under which the restrictions placed by the Soviet authorities on transport between Berlin and the Western zones would be lifted simultaneously with the introduction of the German mark of the Soviet zone as the sole currency in the city. The issue and continued use in Berlin of this currency was to be under four-Power control. Marshal Stalin, on 23rd August, personally agreed to these arrangements and to the directive sent to the four Military Governors.

3. The Soviet Military Governor, however, soon made it plain that he was not going to conform to the agreed directive. He not only refused to lift the existing restriction on transport, but demanded that air transport should also come under Soviet control. The argument used for this latest outrageous demand was that, as the new currency was to be the Eastern zone mark, Russia must control all trade between Berlin and the outside world. In other words, the Moscow agreement, far from being a gesture of goodwill by Stalin, was a clumsy and crooked manœuvre to try to obtain mastery of the last link between Berlin and the Western zones and so make the position of the Western Allies impossible.

4. On 14th September, the attention of the Soviet Government was called to their Military Governor's disregard of the agreement reached in Moscow. A reply was received upholding the Governor's position and stating, in effect,

that it was intended to disregard the commitment to lift existing restrictions on transport by seeking to impose new and additional ones.

5. It is now quite clear that the Soviet Government has not had the slightest intention of coming to any amicable agreement over Berlin with the three Powers. Their object all along has been to use these diplomatic discussions as a means for prolonging and, if possible, worsening the situation created by the blockade in the hope that the economic pressure under Winter conditions will be such as to compel the Western Allies to give in. Then, the Kremlin hopes, the door will be open to Russian domination of the whole of Germany without resorting to war.

6. A Communist-ruled Germany would be as great, or even a greater threat to Western Europe and ultimately to the free nations of the World, as was the Nazi regime, from which in methods and aims it would be almost indistinguishable.

THE APPEAL TO THE SECURITY COUNCIL

Faced with a situation which might at any moment turn into a universal conflagration and which had for all too long been a menace to peace, the Governments of the three Powers decided to have recourse to the Security Council of the United Nations Organization.

The Kremlin at once tried to wriggle out of this " show down," first by proposing to resume the abortive discussions with the three Powers and, when this failed, by protesting that there was no threat to peace and that the Berlin dispute could not, therefore, be placed on the Security Council's agenda. On 5th October, however, the Security Council, by 9 votes to 2 (the U.S.S.R. and the Ukraine) decided to place the subject on its agenda.

Efforts by neutral parties, under the initiative of the Argentine Foreign Minister, to get an agreement behind the scenes having failed, the Council reassembled on 15th October and the parties to the dispute were asked to answer two questions for the enlightenment of the neutral members :—

(1) to explain the imposition of the restrictions on communications imposed both by Russia and the Western Powers, and to give details ;

(2) to give a detailed explanation of the agreements reached in Moscow between the four Powers, and the instructions sent to the Military Governors in Berlin, together with the reasons which had prevented the agreement from being carried out.

These penetrating questions obviously led to the heart of the matter. The representatives of the three Western Powers, having nothing to conceal, expressed their Governments' readiness to supply the information ; but M. Vyshinsky evaded the issue by taking refuge in his contention that the dispute did not fall within the competence of the Security Council.

The " neutrals," having met in private, eventually evolved a resolution designed to disperse " artificial differences " and to create " an atmosphere favourable to understanding." Briefly, this resolution called upon France, the United Kingdom, the United States and the U.S.S.R. to prevent any incident which would aggravate the situation in Berlin and to take the following steps to end the dispute :—

(*a*) Immediate removal of all restrictions on communications, transport and commerce between Berlin and the Western and Soviet zones.

(*b*) Immediate meeting of the four Military Governors to arrange for the unification of all currency in Berlin on the basis of the German mark in the Soviet zone, as agreed by the four Governments in Moscow and promulgated on 30th August, 1948, to be carried out under the control of the quadripartite financial commission.

(*c*) The date when the currency agreement shall take effect to be 20th November, 1948.

Within ten days of the fulfilment of these measures, the Council of Foreign Ministers should reopen negotiations on all outstanding problems concerning Germany as a whole.

Here, then, was the considered solution of this critical problem, drawn up by the highest international body, representing a majority of the disinterested nations of the World. It was put to the vote and, again, 9 votes were in favour and 2 (the U.S.S.R. and its satellite Ukraine) against. Such is the meshwork of procedure with which the United Nations Organization has entangled itself, that the Soviet veto meant that the resolution could not even be carried, much less put into effect; and after the debate, "the Council adjourned." Comment on the subsequent position can, therefore, only be expressed adequately and concisely by borrowing from our American cousins that comprehensive ejaculation—"So what!"

Mr. Bevin, in a speech to Parliament earlier in October, had made it quite clear where the Western Powers stand. Alluding to the policy we (the three Western Powers) shall jointly pursue, if that (the lifting of the blockade as an essential condition to any settlement) fails, he remarked, "We are not committed to war, and all the other things that might ensue. . . . But we have to make provision to minimize the effects of a blockade by those who think that by this dastardly scheme they can put pressure on the Western Allies who stood by them in the War."

WESTERN UNION DEFENCE

The Defence Ministers of Britain, France, Belgium, the Netherlands and Luxembourg met in Paris on 27th and 28th September. General Kibler, of the U.S. Army, and other American and Canadian observers were present. Afterwards it was announced that the Ministers, having studied the reports of the Chiefs of General Staff of the five Powers, had agreed on a common policy, the aim of which was to assure the security of those Powers.

It was decided to set up a permanent organization to apply this policy and to deal with problems of production and acquiring of material. The organization would comprise members of a land, air and sea command, with a permanent military president.[1] It would study tactical and technical problems concerned with the defence of Western Europe.

NORTH ATLANTIC DEFENCE PACT

On 25th-26th October, the five Foreign Ministers met in Paris and, amongst other matters, discussed the question of North Atlantic security and the conversation on this subject which had taken place in Washington during the Summer. Complete

[1] Appointments to these posts will be found in General Service Notes of this JOURNAL.

agreement was reached on the principle of a defensive Pact for the North Atlantic and on the next steps to be taken.

Hitherto, the United States seemed rather to have taken up the role of interested spectator in the various efforts made to close the ranks in defence against the Eastern menace. With the completion of the Presidential Election and installation of Mr. Truman firmly in office, however, things began to move towards a more active participation in the military affairs of the Western Allies. From the American point of view, a North Atlantic Pact would link with the Rio Treaty[2] for the mutual defence of the Americas. Under this an armed attack against any American state commits all to assist in meeting it. An article in the Treaty which is pertinent to an Atlantic Pact is that which provides for consultation on measures to meet an aggression which is not an armed attack.

The Times of 8th November said that Canada was known to have informed the U.S. Government of its readiness to enter into negotiations. The Brussels Treaty Powers had previously announced their equal willingness. It was assumed that this would not have been done without being reasonably confident that the U.S. Government was ready to make the necessary commitment. The same paper forecasts that preparatory work for a North Atlantic Pact would be completed by the end of this year, that a conference would be held early next year, and that the Pact would be ratified in June.

Meanwhile, it has just been made known that very practical and timely aid has been given by the United States to France in her efforts to rebuild her defences, in the shape of $5 million worth of surplus equipment. It is thought that this will produce 10 divisions, fully equipped with American material, at an early date.

THE COMMUNIST THREAT TO CHINA

Momentous events are taking place in Eastern Asia. Communist armies from Manchuria are sweeping down on China from the North. Mukden fell on 1st November, and Nanking is threatened. On 10th November, it was reported that a large force of Communists from Jehol had penetrated the Great Wall, thus turning the Shanhaikwan position and threatening the Tongshan coal mines.

"The fall of Mukden," says *The Times*, "marks a crossroads in the warring course of modern China. It is the culmination of six months of military disaster which has finally ended President Chiang Kai-shek's hope of uniting the country under his own administration."

Sinister as this further expansion of political and military power under the label of Communism seems, some consolation may be found in the fact that it does not appear to be directly attributable to Russian initiative. It is true that the Soviet has assisted by facilitating the ransacking of Manchuria for Japanese arms by the Chinese Communists, but their leaders are not disposed to take orders from the Kremlin and are putting their own interpretation on Communist ideologies.

The great danger to the Chinese people is that they will be cut off from the mineral wealth of Manchuria which is so important to industries in the South and, as the victims of warring elements, will find themselves thrown back into a state of primitive disorder and distress—all making for further chaos in a chaotic World.

[2] See JOURNAL for May, 1948, page 290.

CORRESPONDENCE

(Correspondence is invited on subjects which have been dealt with in the JOURNAL *or which are of general interest to the Services. Correspondents are requested to put their views as concisely as possible, but publication of letters will be dependent on the space available in each number of the* JOURNAL.—EDITOR.)

CONSCRIPTION

To the Editor of the R.U.S.I. Journal.

SIR,—Lieut.-General Sir G. Le Q. Martel's letter on conscription and its alternatives raises several debatable points, not least amongst which is his claim that his views on the subject are those of " a large proportion of the more thoughtful officers in the Army." Whilst this statement may be accurate in so far as it affects the General's own circle or the officers of, or in the region of, his seniority, it is fair to claim that with regard to the Army as a whole, it can only be an assumption and not a definite statement of fact.

It would probably be more correct to state that if there was an unconditional choice between a first class Regular Army, and Conscription, the almost unanimous vote of the Regular Officers would go to the former. Unfortunately, various present day factors weigh heavily against the adoption of the Regular Army in the form suggested by the General. In the space of this letter it is impossible to deal thoroughly with all these factors, but I feel that the following arguments will suffice.

Although it is merely three years since the Second World War ended, the present political situation does not encourage hopes that there will be no future war. The primary task of the Regular Army is to be prepared to defend the Country's interests in time of War, but at the same time the Country should take the necessary steps to ensure that the Regular Army can be reinforced and supported with the least possible delay by Reservists and by the Territorial Army.

If these facts are accepted, it becomes clear that in time of war the Regular Army will often, if not always, be forced to play a " holding " role, until it is reinforced sufficiently to enable it to take the offensive. This has, in fact, happened twice in the present Century. On the first occasion the " Old Contemptibles " fought the retreat from Mons, and in the second case the majority of our peace-time Army was forced back to Great Britain through the beaches of France and Belgium. In both cases, sufficient personnel and equipment to deal effectively with the enemy's onslaught were not forthcoming, due to the faulty peace-time organization of the forces.

It appears to me that the General's idea of a Regular Army of 200,000 and no Conscription would tend to have the same result. This appearance is all the stronger in view of his assumption that the Country has a " magnificent reserve " in those men demobilized since 1945. Certainly the material is there, but one must remember that the Army is now digesting the lessons of the last war with the resultant changes in its equipment, its organization and its methods. This being so, our demobilized personnel will gradually become more and more out of date as the majority of them have been out of touch with the Army since the date of their demobilization.

Again, even if we accept the General's plan up to this point, he gives us no inkling of the future, other than the possibility of having to think again after a period of 5–10 years. This policy is dangerous, if only for the fact that we may find ourselves in the process of reorganizing our military system at a time when a potential enemy arrives at the point where his post-war military plans have reached fruition.

As the General states, any future war may be of a totally different nature to the last one, but there is no sign yet of any scientific development that will change warfare sufficiently to warrant the discarding of armies in their present form. The one thing which is reasonably certain, however, is that the outbreak of a future war may well be sudden, with the probable result that a nation whose reserves cannot rapidly be mobilized to the support of the Regular Army will be overwhelmed in a matter of weeks if not days.

From these arguments it will be seen that the key to a successful military system is the standard reached by, and the numbers contained in, the nation's reserve. Under the present system the Regular Army acts as a training cadre for the youth of the nation for the initial period of one year and then passes it on to the Territorial Army for several partially active years on the reserve. In this way a continually up-to-date and strong reserve is formed and one which can be mobilized for active service with very little delay.

In my opinion, therefore, Conscription is the right solution to our military problem and criticisms should not be directed at the system but rather at the manner in which the system is worked. If the desired result is to be obtained it is essential that the Regular Army cadre should contain only the very best material in order to ensure the highest possible standard of training for the National Service conscripts. Leading on from that point, an ever watchful and critical eye must be turned upon the conditions of service in the Territorial Army. The compulsory parades, camps, etc., must be numerous enough to ensure that the nation's military reserve is kept up-to-date with Regular Army methods and equipment. Again, this can only be accomplished if the Territorial Army is well staffed and equipped.

Headquarters Vienna Area,
22nd September, 1948.

E. O. PROTHERO.
Captain.

SIR,—I find it hard to agree with your correspondent that the problems raised in my Trench Gascoigne essay revolve mainly around conscription. Certainly in the few lines I devoted to the subject there is no suggestion that we can attract the best of the nation's manhood by accepting conscription and modernizing the customs of the Services; nor can I find any mention of conscription in my summary of the methods to be adopted in achieving this aim. However, my belief remains that conscription at this time is a political necessity. Any freedom loving people will rally to a just cause in defence of their liberty and their rights, but once the cause is won and the danger past there comes a natural revulsion to all matters connected with war and national service. So the question is, quite simply, could we have attracted as many young men as volunteers into all three Services during the years since the War as have come forward under the National Service Act? We cannot afford to miss these young men, and the alarming failure of our recruiting campaigns to date leads us to think that we could not have brought them forward in any other way.

Conscription affects all three Services and I agree that few, if any, will support the policy of conscription versus Regulars if Regulars can be obtained. May I quote from my essay: "But we cannot devote too much of our attention to conscripts qua conscripts. Our quarry is the young man who is on the threshold of life and is undecided on a career *and* the conscript who comes forward for his period of service with an open mind as to his future." To me, that implies that there are two classes of young men demanding our attention—the volunteer and the conscript who volunteers for Regular service before his term expires.

So far as modernizing the customs of the Services is concerned, this is a concomitant action with all other forms of progress. No one really wishes to pamper the young men in the Services, but there is ample evidence available that work and health efficiency increase with improvements in living and working conditions. Many officers would like to see a return to the old style discipline, but it must be applied to-day in the more subtle ways demanded by increased education and a greater awareness, and in the light of a changing mentality among the soldier-technicians. Self-respect, loyalty, esprit de corps, example, precept, leadership and integrity still remain the ingredients of good discipline, and they are not absent in the young man of to-day, whatever his walk of life.

S. G. WALKER,
Wing Commander.

7th October, 1948.

SIR,—The writers of the two letters which you publish in this JOURNAL, with reference to Conscription, both agree that we must have strong Regular forces. This is obvious because a crisis of the Greece, Berlin or Malaya type will continue indefinitely until we do possess these forces. They both however express fears about our ability to raise them without endangering our defence forces in other ways. The answers to these fears cannot possibly be brief. I have given my answers in Press articles in the *Evening Standard* of 18th August, 1947 and 24th September, 1948. Also in the *Daily Mail* of 19th April and 2nd September, 1948, and with slight references in the *Sunday Times* of 17th October, 1948 and the *Sunday Dispatch* of 12th September, 1948.

These articles cover all the points raised in these two letters and also many other points. No one has yet found any valid fault in the reasoning which they contain. Indeed the views have received wide support.

The R.U.S.I. published an article by myself in August, 1947, but the general plan had not been worked out in detail at that time. I was anxious to publish another article more recently but there was insufficient space in the JOURNAL. I therefore had to turn to the Press though I would much rather have dealt with this very vital matter in the R.U.S.I. JOURNAL.

G. Le Q. MARTEL,
Lieut.-General.

20th October, 1948.

THE OFFICER'S WEAPON

SIR,—The problem of the officer's weapon, raised in the R.U.S.I. JOURNAL of August, is a difficult one. So much depends not only on the officer's arm of service and the circumstances, but also on individual whims and ideas. Obviously we must have some kind of standardization, and the solution probably lies in Mr. Baxter's suggestion of two weapons—a pistol and a carbine.

Exactly what kind of weapons do we require? First, the pistol: the (theoretically excellent) .38 in. issue type revolver is not a popular weapon. The 9 mm. automatic, as issued to Airborne Forces, is admirable in many ways, though its butt is too wide for the average hand, and accuracy is not easily achieved. Probably the most popular automatic is the American Colt .45 in., but ammunition is expensive and hard to come by, and much practice is required to achieve any degree of confidence. The German P.38, mentioned by Mr. Baxter, is a clumsy and complicated weapon, whilst the famous Lüger, though probably the best *target* automatic in existence, is out of the question.

The answer, therefore, lies in an entirely new automatic, designed on the lines of the Browning 9 mm. and Colt .45 in., ruggedly built and shooting the same cartridge as the Sten machine carbine—or rather its successor; though it should be mentioned here that the normal 9 mm. bullet is not a satisfactory pistol bullet, having too high a velocity and insufficient stopping power.

Secondly, there is the carbine. Mr. Baxter mentions both the .300 in. Winchester semi-automatic and the sub-machine gun, fully automatic types. The infantry officer definitely requires a fully automatic machine carbine for use in the final stages of the assault. The American "Tommy gun" is too cumbersome. The Sten and its various "imitations" is an unsatisfactory weapon, requiring constant attention and maintenance, for which the officer on active service has no time. So let the experts design us a new machine-carbine—a reliable, light-weight weapon with a folding butt, wooden pistol grip, provision for semi or full auto-fire, a magazine with a strong spring to hold a minimum of 20 rounds, and a self-locking breach block to eliminate the accidents so frequent with the Sten.

Every officer could then be issued with a pistol, to remain his personal weapon until he leaves the Service, whilst every infantry battalion could hold a pool of extra machine-carbines for issue to officers as required.

Until these new weapons are available, every officer should be issued with a pistol of whatever type is available, which he can retain until he leaves the Service; infantry battalions should be issued with sufficient Stens to allow one per officer, and every effort should be made to increase the supply of practice ammunition for both weapons.

J. C. SLATER,
Lieutenant, 60th Rifles.

11th October, 1948.

SIR,—I was very interested to read Mr. Baxter's article on "The Officer's Weapon," and would like to suggest that this is a case for the good old British compromise.

It should be possible to produce a weapon that is light, dual-purpose, reasonably accurate and with most of the advantages of both pistol and the automatic rifle. The bore depends, of course, on the current weapons and 9 mm. seems to be here to stay for a time at least. There are, however, a number of essentials: a magazine of 15–20 rounds that is quickly replaceable, the trigger mechanism to be "revolver action" first shot and thereafter "automatic," light weight, small bulk, and well balanced both with and without its butt, to mention but a few of the more obvious ones. The pistol, holster and butt piece—the latter in two parts, butt and framework—should all fit together when not in use like a "nest" of drinking mugs.

It is felt that this weapon would have two advantages over the Winchester .30 automatic rifle, namely, that it could be used as a pistol for close-range personal protection in Internal Security roles as in Palestine, and also that it could be carried by R.A.F. fighter pilots even when using the Rocket Ejection Seat.

Furthermore, it is only human nature to equip oneself with the best possible weapon, and until we produce a better one than the enemy, it will remain the habit for officers to acquire other weapons and use them in preference to their own, thus producing an added ammunition problem.

P. B. CAVENDISH,
Captain, 3rd The King's Own Hussars.

7th September, 1948.

SIR,—I read Mr. E. H. Baxter's article on "The Officer's Weapon" with great interest, but feel bound to raise a point.

The trouble with giving an efficient weapon to an officer is that he will be tempted into taking an actual part in the fighting instead of playing his role in the directing of it. After discussing their adventures in 1940 with officers of the 51st Highland Division who got back to England, I gave up the rifle I had acquired. They had convinced me that an officer with a rifle could not resist getting down and using it; once down he became no more useful than the privates he was supposed to be leading.

J. WILBUR G. COCKE,
Captain.

12th September, 1948.

SIR,—Mr. E. H. Baxter, in his interesting article, "The Officer's Weapon," makes the statement that, so far as is known, commissioned ranks have never been equipped with the bayonet.

I have before me a set of coloured postcards of British Regiments, Ticonderoga, 1758–1777, by Alex. E. Cappley. One of them depicts an officer of the 20th Regiment. He is equipped with a "hanger" and a musket with bayonet fixed. The description states that he carries "a musket and bayonet so at a distance they resembled the other ranks, and so stood less chance of being picked off by the American sharpshooters."

RUSSELL STEELE,
Captain.

September, 1948.

SIR,—Mr. E. H. Baxter's interesting article in your August, 1948, issue contains numerous controversial points, some of which I must contest.

In choosing the weapon to be issued to officers, surely the characteristics to be specified must include :

(*a*) Fire Effect and Stopping Power.
(*b*) Handiness and Sturdiness.
(*c*) Uniformity of ammunition with other weapons.

The last of these considerations alone rules out shot guns, which in addition are not handy to carry about and moreover have very bulky ammunition. Consideration of the above requirements in relation to the other weapons mentioned leads to the following conclusions :—

The Pistol.—The main argument against arming other ranks with pistols for special operations, such as street fighting, is that a pistol in the hands of an untrained man is almost as great a menace to one's own troops as to the enemy. There is, of course, seldom time to train men normally otherwise armed in its use.

A pistol in Service use now is the Browning 9 mm. self-loading pistol, which fires the same ammunition as the Sten machine carbine. Moreover, its safety devices are adequate and it is easy to strip and maintain.

The Machine Carbine.—That " to the marksman or connoisseur of weapons the sub-machine gun is a thing of horror " is incontrovertible. It is open to doubt, however, whether either of these are the men who use it in battle.

While of course not defending the gangsters who possibly originated this weapon, I would say that their experience of close quarter fighting seems to have been considerable and, as they trained in a very practical school, it seems likely that they evolved an efficient weapon for that particular role.

The present day 9 mm. Sten machine carbine is sufficiently accurate up to 100 yards and can produce a considerable weight of fire at close quarters. It can fire single rounds or bursts. Whether the 9 mm. bullet has sufficient stopping power is a debatable point.

The U.S.M.I. Carbine.—The drawback to this weapon is that it requires ammunition different from that in normal issue. Otherwise it appears an excellent, handy weapon.

To sum up, I am not convinced that Mr. Baxter provides a sufficiently weighty argument for replacing the present pistol or Sten machine carbine as the officer's weapon, nor that he provides adequate alternatives. But perhaps that was not his intention.

M. R. TATE,
Captain, Royal Marines.

6th September, 1948.

BATTLESHIPS' PART IN THE WAR

SIR,—Commander G. M. Bennett's article on " Battleships' Part in the War " makes certain statements which might convey a wrong impression to future generations if left on record without comment. Alluding to the part played by battleships in the Indian Ocean, he states that Ceylon and India were saved from sea-borne invasion by the " Warspite," " Revenge," " Resolution," " Ramillies " and " Royal Sovereign." Referring to Winston Churchill's recent book " The Gathering Storm " we find on page 367 the following statement :—

" Throughout the War the ' Royal Sovereigns ' remained an expense and an anxiety. They had none of them been rebuilt like their sisters the ' Queen Elizabeths,' and when, as will be seen in due course, the possibility of bringing them into action against the Japanese fleet which entered the Indian Ocean in April, 1942, presented itself, the only thought of the Admiral on the spot, of Admiral Pound and the Minister of Defence, was to put as many thousands of miles as possible between them and the enemy in the shortest possible time."

Apart from the view expressed in Winston Churchill's book, I think that an impartial study of the documents relating to the Japanese operations off Ceylon will reveal that their decision to retire was entirely due to the most decisive defeat that they received at the hands of the R.A.F. during their two large air attacks on Ceylon. The fact that there was an organized air defence system in Ceylon was a great shock to the Japanese and it had far-reaching effects on their subsequent operations.

Commander Bennett gives but meagre credit to aircraft for the part they played in the " Bismark " operation. He states that, though aircraft played their part in the operation, the " Bismark " was finally fixed by surface craft and reduced to a blazing wreck by the " King George V " and " Rodney." Without the sighting report by the R.A.F. Catalina it is almost certain that the " Bismark " would have escaped detection, and later, attacks by naval aircraft enabled the heavier Fleet Units to come into the operation ; the " Bismark " having been further beset by torpedoes from our destroyers.

Commander Bennett also refers to the escape of the " Scharnhorst " and " Gneisenau " from Brest on the 12th February, 1942, and states that they " risked all dangers of air attack, etc., rather than face a possible conflict with the battleships of the Home Fleet out of Scapa." I suggest that there would have been heavy demands on Coastal Command for their location once the Admiralty had discovered their departure, and on the whole of the Air Force for their subsequent destruction when once located. As it was, Hitler naturally chose the lesser risk of an unexpected dash up the Channel and through the Straits of Dover as this course of action exposed the ships to a far shorter period of air attack during the short hours of daylight and furthermore, the forecast weather conditions were heavily in favour of this course of action. As it was, both ships were severely damaged even though only very limited air and sea action could be taken against them.

Finally, Commander Bennett states that " British battleships were directly or indirectly responsible for the destruction of all German battleships ; even, one suggests, those which were sunk in harbour by the R.A.F., since it was the Home Fleet ' in being ' which kept them there as sitting targets, etc." This view is hardly upheld in the excellent account of Admiral Brind's lecture on " The Home Fleet in the War " (Page 385 of the JOURNAL for August, 1948) which is as follows :—

> " The immediate problem facing Sir Henry Moore was to put the ' Tirpitz ' permanently out of action so that the battleships and carriers could be withdrawn to form the British Pacific Fleet. Two large operations were carried out with the carrier force which then consisted of three fleet and two escort carriers. The first operation was in July and the second in August, and both were rendered inconclusive by the enemy smoke-screen. An R.A.F. detachment of bombers, specially sent to North Russia, struck in September and scored a heavy hit. This was considered sufficient to justify the reduction of the Home Fleet to the minimum strength required to deal with the German Baltic Fleet in case of a break-out. The ' Tirpitz ' was eventually sunk by R.A.F. bombers in November, 1944. It must be recalled that in all these air attacks on the ' Tirpitz ' we had in effect attained air superiority, for there was no fighter opposition."

C. E. CHILTON,
Group Captain.

20th October, 1948.

SIR,—May I be permitted to point out a slight inaccuracy in Commander G. M. Bennett's " Battleships' Part in the War " in the JOURNAL for August, 1948. He states : " The ' Warspite ' was far more effective at Walcheren than the ' Roberts ' and ' Abercrombie ' who accompanied her." The " Abercrombie " was, in fact, in the Mediterranean at that time.

As regards the relative utility of the battleship and the monitor for bombarding, it should be remembered that, although the former mounts four times the number of guns of the latter, she does not necessarily carry four times the outfit of suitable ammunition.

She can smother a shore target but, surely, only in direct bombardment and before the landing. It would be interesting to know how often the Army F.O.O's required eight rounds fired simultaneously and how often they called for it.

During a shoot carried out by the "Roberts" at night at a tank concentration near Caen—contributory to the opinion in the footnote on page 424 of the article referred to—the ship was listed four degrees to get the range, and a single gun was used because the jacket of the other was cracked. The rate of fire achieved by one gun was seemingly sufficient.

In his comparison between battleships and monitors, Commander Bennett omitted all reference to draught. The distance the bombarding ship must keep to seaward must be subtracted from her effective range, and no battleship can bombard from within the six fathom line. Shore defences are probably sited to defend deep water channels. This means that battleships must, metaphorically, come up the drive and knock at the front door; a side entrance is possibly available to monitors.

C. F. AGUTTER,
Lieut.-Commander, R.N.

25th September, 1948.

SERVICE IN WEST AFRICA

SIR,—Lieut.-Colonel Bowen's article on this subject in the August, 1948, JOURNAL is both interesting and timely, and I agree with much he says, particularly as to the erroneous opinions held by the ignorant about West Africa. But I must join issue over the statement that in my article, "The Military and Economic Importance of West Africa," in the JOURNAL for February, 1948: "too much emphasis is placed upon the heavy tropical rain, the swamps, the impassibility of certain areas, and their lack of visibility."

The expression "heavy tropical rain" does not appear in my article. I merely stated: "Near the coast the rainfall is heavy," and went on to remark that the rainy season is shorter in the northern parts of the Colonies and the climate is less trying. All of which is quite true; and I used no superlatives. The word "swamps" appears twice, once in a brief description of the coast line and a second time in connection with the possibility of landings from the sea. Nowhere do I state that any area is "impassible," for the simple reason that no such country exists there. So far as "visibility" is concerned, this is shown to vary according to the type of "bush"; which it does.

Lieut.-Colonel Bowen remarks: "It would be more true to say that while these phenomena exist, as they do also in India, their worst features are found in areas not occupied by the European and certainly not generally used by troops." In this connection, I would point out that within easy walking distance of the R.W.A.F.F. station at Kumasi there is tropical forest with features such as I have described. This is the Ashanti Forest and I do not think there is anything comparable in India except, perhaps, in the North-East, which I have not seen.

Finally, I would remark that one of the objects of my article was to describe the factors in West Africa affecting military operations in the widest sense, and not from the point of view of its desirability as a place of residence. There is also the aspect of training, and in this connection I quote the following from *Notes on Training in Bush Warfare*:

> "4. *Officer's knowledge of the country.*—The efficiency of native troops depends on the personality, military knowledge, and power of speaking the language of the officer. Officers must have a good knowledge of the country, the language and the use of the compass. They should be encouraged to photograph or shoot big game, for by doing so they gain a knowledge of conditions in the bush not attained in any other way."

I need not elaborate on this quotation.

F. A. S. CLARKE,
Brigadier.

30th August, 1948.

NOTE:—Other correspondence is held over due to lack of space.—EDITOR.

GENERAL SERVICE NOTES

WESTERN UNION DEFENCE ORGANIZATION

Appointments

In a *communiqué* issued on 28th September, 1948, it was announced that the permanent defence organization established by the Ministers of Defence of the Brussels Treaty Powers included the nucleus of a Land, Air, and Naval command, with a permanent Military Chairman.

The Governments of the Brussels Treaty Powers have now appointed the following officers :—

Commander-in-Chief Land Forces, Western Europe.—Général d'Armée Jean de Lattre de Tassigny.

Commander-in-Chief Air Forces, Western Europe.—Air Marshal Sir James Robb, K.B.E., C.B., D.S.O., D.F.C., A.F.C.

Flag Officer Western Europe as Naval Representative.—Vice-Admiral Robert Jaujard, Croix de Guerre, C.B.E.

The Governments have also appointed as permanent Military Chairman of these Commanders-in-Chief in Committee :—

Field-Marshal Viscount Montgomery of Alamein, K.G., G.C.B., D.S.O.

The staffs of the Military Chairman and the Commanders-in-Chief will include high-ranking officers from the Netherlands, Belgium, and Luxembourg.

As previously stated, the task of these officers is to study the tactical and technical problems of Western European defence.

On 11th October, it was announced that Brigadier R. F. K. Belchem, C.B., C.B.E., D.S.O., has been appointed Chief of Staff to the Chairman, West Union Commanders-in-Chief Committee, with the temporary rank of Major-General.

The appointment is also announced of Captain R. M. Dick, C.B.E., D.S.C. to be Chief Staff Officer to the Flag Officer Western Europe, to serve in the rank of Commodore, 1st Class.

DEFENCE MANPOWER

The Ministry of Defence, on 27th August, published the second of a series of quarterly statements showing the Country's defence manpower. The statement, which covers the period up to 1st July, shows the strength of the uniformed armed forces, the number of civilians directly employed on work for the Services, and the strength of the auxiliary and Territorial forces.

The total strength of the armed forces was 846,400, compared with 931,200 on 1st April, a reduction of 84,800. This figure was made up as follows : Royal Navy, 143,100 (144,400 on 1st April) ; Army, 465,800 (530, 900) ; and Royal Air Force, 237,500 (255,900). The totals include National Service men, the members of the women's auxiliary Services, and nurses and V.A.D.s. The distribution of National Service men was : Royal Navy 20,300 : Army, 279,200 ; and R.A.F., 116,600.

The total number of civilians directly employed on work for the forces was 229,200. Of these 115,500 were non-industrial employees, including those engaged on production, research and development, and works. The number of industrial employees (excluding those engaged on production, research and development, and works) was 113,700. In additional to the directly employed non-industrial staff, there was an estimated average throughout 1947-48 of 350,000 engaged on production, research and development, and works.

The total number of members of the armed forces and civilians directly employed was 1,075,600, compared with 1,166,000 on 1st April.

The total strength of the auxiliary and Territorial forces was 55,500, an increase of 6,600 over that of the previous quarter. This figure is made up as follows: R.N.V.R., 2,500; Territorial Army and A.T.S. (T.A.), 48,800; R.A.F.V.R., 2,300; and R.Aux.A.F., 1,900.

REGULAR RECRUITMENT.—Recruits of ratings and other ranks for the Regular forces in the third quarter of 1948, i.e., from July to September, were :—

Royal Navy	4,957
Army	8,769
Royal Air Force	2,671
	16,397

The total for the first three quarters of 1948 was 50,054. The total comparable recruitment in 1947 was 95,515. The main cause for the overall fall-off is the steady decline of recruitment for the Royal Air Force.

METEOROLOGICAL SERVICES

The Annual Report of the Director of the Meteorological Office, published on 4th September, gives particulars of recent developments in the services provided by this organization.

At Malta and Shaiba facilities now exist to enable over-flying aircraft to discuss the weather situation with the duty forecaster by radio-telephony.

The international scheme for the establishment of thirteen weather stations in the North Atlantic is proceeding. The first British Ocean Weather Ship took up her station in August, 1947, and the remaining three were all in action by January, 1948.

Certain Colonial Meteorological Services which came under Air Ministry control during the War were handed back to the local Governments. All necessary assistance was given to these and other Colonial Services to enable them to function efficiently.

Research work included :—

(*a*) An exhaustive study of the distribution of wind all over the World up to heights of over 45,000 feet necessary for air route planning.

(*b*) Other research for aviation concerned with means of enabling aircraft to avoid turbulent clouds, means of reducing the risks of ice accretion, and the navigational technique known as pressure pattern flying.

(*c*) Forecasting research, using circumpolar weather maps and further study of the physical principles of the atmosphere. Detailed studies of errors in routine forecasts were made, focussing attention on the inadequacies of current knowledge.

(*d*) Work for agriculture on the meteorology of the air near the ground, especially in connection with its water vapour content.

(*e*) In the field of meteorological instruments, work on instrumental means of measuring cloud height in daylight, the visibility at night, and balloons to carry instruments to a height of 100,000 feet.

AUSTRALIA

RECRUITING

Latest recruiting figures show that Australia's fighting Services are growing in strength. Recruiting rates are now above discharge rates.

At the beginning of August the Royal Australian Navy was 10,651 strong, compared with a planned strength of 14,753 by June, 1952.

Army figures suggest that the planned citizen military force strength of 50,000 may be reached within a year.

More than half the 12,000 R.A.A.F. personnel planned for by June, 1952 have been enlisted.

B.C.O.F. IN JAPAN

By the end of the year all British and New Zealand forces will probably be withdrawn from Japan, leaving only Australians there.

The Australian components of the British Commonwealth Occupation Force is gradually being reduced. Present Australian strength in Japan is about 4,500. Plans for the future provide for the maintenance in Japan of a token force of 2,500, comprising mostly Army services.

CANADA

CANADIAN DEFENCE

The Minister of National Defence, Mr. B. Claxton, delivered an important speech in the House of Commons, Ottawa, on 24th June, 1948. The following are some extracts :—

CO-OPERATION.—" Because of our singular position as a member of the British Commonwealth and as the friendly neighbour of the United States, it is in our interest to have the maximum co-operation with the forces of both countries. . . . We have interchanges of information, staff, training officers, equipment, designs and so forth. These arrangements are, I believe, entirely satisfactory to all concerned."

TRAINING.—" With the opening of the National Defence College at Kingston in January we began an institution for the advanced study of problems of war and security and their relations to other aspects of Government action and policy. . . . There is close co-operation regarding training and exchanges of staff and students with the corresponding British and United States schools. Selected officers from the three Services are given post-graduate courses at Canadian and other Universities.

" With regard to reserve training, all three Services have been set up on a post-war basis with modern equipment and full-time training officers. Many units have most of their officers and N.C.O's and about 50 per cent. of their establishment. In addition, we still have over a million trained men and women who saw service in the Second World War."

OFFICERS.—" As to Cadet Training, Royal Roads at Esquimalt last fall started operation as a joint R.C.N.—R.C.A.F. college, and this September will begin training officers for all three Services. The Royal Military College, Kingston, will reopen in September also as a tri-Service college.*

" Having officers for all three Services trained at the same colleges is an original and bold innovation, which we believe will prove to be fully justified.

" A further source of officers for the forces, both permanent and reserve, is the Universities. A student member of the Canadian Officer Training Corps can qualify for a Commission in the permanent forces on equal terms with a graduate of one of the Service colleges. There are similar arrangements for the Navy and the Air Force.

" Men in the ranks suitable for Commissions will be assisted in securing the required standard of senior matriculation and sent at Government expense, if under twenty, to a Service college ; if over that age, to a University."

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* The actual opening of the College took place on 20th September. The R.M.C. had not been functioning since 1942. The Cadet course is of four years duration. On graduating, though there is no compulsion to do so, every Cadet will be asked to serve in one of the three Services.

RESEARCH.—"The importance of defence research and of the development of new weapons is shown by the appropriation of $16 million requested for this purpose."

STANDARDIZATION.—"Canada has a strong interest in the standardization of training and operational techniques, communications procedure, classification and handling of stores, industrial standards and the adoption of common weapons and equipment. Discussions have been taking place with the United States towards this end. Similar discussions have been carried on with the United Kingdom. Progress is being made."

STRENGTH OF ARMED FORCES.—"On 31st May, 1948, the strengths of the armed forces were as follows:—

	Navy	*Army*	*Air Force*	*Total*
Now authorized	7,500	18,750	12,075	38,325
Authorized for additional commitments.	375	1,329	2,121	3,825
Total authorized	7,875	20,079	14,196	42,150
Strength 31st May, 1948 ...	6,995	16,462	12,291	38,748
Percentage of total authorized ...	89	82	87	85"

INDUSTRIAL WAR POTENTIAL

A civilian organization—the Canadian Ordnance Association, was formed in 1947 to study plans for the best utilization of the industrial war potential of Canada in the event of another major war.

Soon after the Association began to function, it received the full co-operation of both the Canadian Government and the Armed Forces. In March, 1948, the Government formed, by Order in Council, the Canadian Industrial Defence Board, which is specifically charged to work with the Canadian Ordnance Association. The three chief supply officers of the Canadian Navy, Army and Air Force are ex-officio members of the Canadian Industrial Defence Board and Directors of the Canadian Ordnance Association.

NAVY NOTES

GREAT BRITAIN

H.M. The King

The King visited Naval Establishments at Chatham on 21st July and honoured Admiral Sir Harold Burrough, Commander-in-Chief, The Nore, and Lady Burrough, with his presence at luncheon.

The King and Queen, accompanied by the Princess Margaret, visited R.M.S. " Queen Elizabeth " at Southampton on 28th July. Captain C. M. Ford, Commodore of the Cunard-White Star Line, received them on board and showed them round the ship.

The King has approved the appointment of Admiral Sir Henry R. Moore, G.C.B., C.V.O., D.S.O., to be First and Principal Naval Aide-de-Camp to the King, to date 1st October, 1948, in succession to Admiral Lord Fraser of North Cape, G.C.B., K.B.E., on the latter taking up the appointment of First Sea Lord.

The following officers have been appointed as Naval Aides-de-Camp to the King from 10th July, 1948, in succession to the officers named :—

Captain E. M. Evans-Lombe, C.B., in succession to Captain E. G. Abbott, A.M., placed on the Retired List.

Captain D. H. Everett, C.B.E., D.S.O., in succession to Captain O. L. Gordon, C.B., M.V.O., placed on the Retired List.

Captain W. H. D. Friedberger, D.S.O., in succession to Captain J. R. S. Haines, C.B.E., placed on the Retired List.

Captain G. F. Stevens-Guille, D.S.O., O.B.E., in succession to Captain G. O. C. Davies, placed on the Retired List.

Captain M. H. Evelegh, in succession to Captain (Commodore 2nd Class) A. L. Poland, C.B., D.S.O., D.S.C., promoted to Flag Rank.

Captain J. L. Storey, C.B.E., D.S.O., in succession to Captain H. Drew, C.B.E., D.S.O., placed on the Retired List.

Captain J. W. Farquhar, D.S.O., in succession to Captain D. K. Bain, D.S.O., placed on the Retired List.

Captain D. Gilmour, in succession to Captain (Commodore 2nd Class) A. D. Nicholl, C.B.E., D.S.O., promoted to Flag Rank.

Captain (S) A. E. Beall, C.B.E., has been appointed a Naval Aide-de-Camp to the King from 28th July, 1948, in place of Captain (S) H. G. Pertwee, D.S.O., placed on the Retired List.

Surgeon-Captain W. J. Colborne has been appointed an Honorary Surgeon to the King from 21st August, 1948, in place of Surgeon Rear-Admiral J. A. O'Flynn, C.B., placed on the Retired List.

It was announced on 29th September that Lieutenant H.R.H. the Duke of Edinburgh R.N., was to be placed on half pay at his own request. It is understood that the Duke wishes to be able to be with Princess Elizabeth next year when, during the Royal tour, she will be fulfilling many engagements on behalf of the King.

King of Denmark an Honorary Admiral

In pursuance of His Majesty's pleasure, King Frederick IX of Denmark, G.C.V.O., has been appointed an Honorary Admiral in His Majesty's Fleet, to date 17th September, 1948.

He is the third Honorary Admiral, King Haakon VII of Norway having been appointed

in 1905 and King Gustavus V of Sweden in 1908. The late King of Denmark, King Christian X, also was an Honorary Admiral in H.M. Fleet.

The appointment coincided with the ceremonies associated with the British Exhibition in Copenhagen and the visit of the submarine depot-ship "Maidstone," Captain H. C. Browne, C.B.E., D.S.O., and of eight submarines to that port. The Duke of Gloucester presented King Frederick with his Commission after a luncheon on board the "Maidstone," which the Queen of Denmark also attended.

Board of Admiralty

The King has been pleased, by Letters Patent under the Great Seal, bearing date the 29th day of September, 1948, to appoint the following to be Commissioners for Executing the Office of Lord High Admiral of the United Kingdom :—

Right Hon. George Henry, Viscount Hall.

Admiral Bruce Austin, Baron Fraser of North Cape, G.C.B., K.B.E.

Vice-Admiral Sir Cecil H. J. Harcourt, K.C.B., C.B.E.

Vice-Admiral Sir Charles S. Daniel, K.C.B., C.B.E., D.S.O.

Vice-Admiral Herbert A. Packer, C.B., C.B.E.

Vice-Admiral George E. Creasy, C.B., O.B.E., D.S.O., M.V.O.

Vice-Admiral Sir John H. Edelsten, K.C.B., C.B.E.

Rear-Admiral Ralph A. B. Edwards, C.B.E.

John Dugdale, Esq.

Walter James Edwards, Esq.

Sir John Gerald Lang, K.C.B.

Flag Appointments

Reserve Fleet.—It was announced on 26th July that Rear-Admiral A. R. M. Bridge had been appointed Flag Officer Commanding, Reserve Fleet, in succession to Rear-Admiral R. M. Servaes, C.B., C.B.E., with effect from 31st August, 1948.

The following appointments were announced on 18th August to take effect in September :—

Middle East.—Rear-Admiral A. L. Poland, C.B., D.S.O., to be Senior British Naval Officer and Flag Officer Liaison, Middle East, in succession to Rear-Admiral H. W. U. McCall, D.S.O.

Training Squadron.—Rear-Admiral E. W. Anstice to be Flag Officer, Training Squadron, in succession to Rear-Admiral P. K. Enright, C.B.E.

Medical Director-General.—The appointment was announced on 26th July of Surgeon Rear-Admiral C. E. Greeson, C.B., to be Medical Director-General of the Navy, in succession to Surgeon Vice-Admiral Sir Henry St. C. Colson, K.C.B., C.B.E., the appointment to take effect on 1st January, 1949.

Captains' Appointments

The following are among the new appointments announced for Captains, R.N. :—

Captain R. M. Dick, C.B.E., D.S.C., to be Chief of Staff to the Flag Officer Western Europe (Admiral Jaujard), to serve in the rank of Commodore, 1st Class.

Captain J. Holmes to the Admiralty (temporary) before taking over the post of Naval Attaché, Washington, in succession to Captain P. W. W. Wootten.

Captain R. K. Dickson to Admiralty (temporary) for duty with the Fourth Sea Lord. Captain Dickson was responsible for co-ordinating arrangements for the unveiling by the Duke of Gloucester on 21st October of the memorial in Trafalgar Square to Admirals of the Fleet Lord Jellicoe and Lord Beatty.

Captain H. C. B. Coleridge to succeed Commander (Acting Captain) J. G. Farrant as Deputy Director of Underwater Weapons, Admiralty.

Captain A. W. Clarke (Retired) to be Chief of Naval Information (15th September), vice Captain C. S. B. Swinley.

Captain W. W. P. Shirley-Rollison to command the R.N. Air Station, Bramcote (22nd September), vice Captain G. N. Brewer.

Captain G. N. Brewer to be Director of Naval Recruiting (28th October), vice Captain H. Drew.

Captain C. John to be Deputy Chief of Naval Air Equipment, Admiralty (2nd September), vice Captain C. C. Hughes-Hallett.

Commander R. S. Christian-Edwards to succeed Captain D. B. Wyburd as Naval Attaché, Copenhagen.

Captain W. J. W. Woods to join the Admiralty Naval Staff (1st December) and later to take over the duties of Director of the Torpedo, Anti-Submarine and Mine Warfare Division, vice Captain R. S. Warne.

Captain J. R. S. Brown to be Naval Attaché, Ankara, vice Captain J. S. Crawford.

Promotions and Retirements

The King has approved the promotion of Admiral Lord Fraser of North Cape, G.C.B., K.B.E., to Admiral of the Fleet, to date 22nd October, 1948.

In consequence the following promotions and retirements have been approved, to date 22nd October, 1948 :—

Vice-Admiral Sir Charles E. Morgan, K.C.B., D.S.O. (Retired), to be Admiral on the Retired List.

Vice-Admiral Sir William G. Tennant, K.C.B., C.B.E., M.V.O., to be Admiral.

Rear-Admiral A. G. N. Wyatt, C.B., to be placed on the Retired List and promoted to Vice-Admiral.

Rear-Admiral the Hon. Guy H. E. Russell, C.B., C.B.E., D.S.O., to be Vice-Admiral.

Rear-Admiral M. M. Denny, C.B., C.B.E., D.S.O., to be Vice-Admiral.

Vice-Admiral Sir Douglas B. Fisher, K.C.B., K.B.E., is placed on the Retired List (13th July, 1948).

Rear-Admiral C. E. Douglas-Pennant, C.B., C.B.E., D.S.O., D.S.C., is promoted to Vice-Admiral (13th July, 1948).

Rear-Admiral H. C. Bovell, C.B., C.B.E., D.S.O. (Retired), Rear-Admiral L. H. Ashmore, C.B., D.S.O. (Retired), and Rear-Admiral J. W. Durnford, C.B. (Retired), are promoted to Vice-Admiral (Retired), (13th July, 1948).

Admiral Sir Arthur F. E. Palliser, K.C.B., D.S.C., is placed on the Retired List at his own request to facilitate the promotion of junior officers (2nd September, 1948).

Vice-Admiral Sir Clement Moody, K.C.B., is placed on the Retired List at his own request to facilitate the promotion of junior officers (2nd September, 1948).

Vice-Admiral Sir Rhoderick R. McGrigor, K.C.B., D.S.O., is promoted to Admiral (2nd September, 1948).

Rear-Admiral E. D. B. McCarthy, C.B., D.S.O., is promoted to Vice-Admiral (2nd September, 1948).

Rear-Admiral G. B. Middleton, C.B., C.B.E., is promoted to Vice-Admiral (2nd September, 1948).

Rear-Admiral A. E. M. B. Cunninghame Graham, C.B., C.B.E., is promoted to Vice-Admiral (2nd September, 1948).

Rear-Admiral R. M. Servaes, C.B., C.B.E., is placed on the Retired List, and promoted to Vice-Admiral (Retired), (2nd September, 1948).

Rear-Admiral H. A. Packer, C.B., C.B.E., is promoted to Vice-Admiral (2nd September, 1948).

On promotion, Admiral McGrigor, Vice-Admiral McCarthy, Vice-Admiral Middleton, Vice-Admiral Cunninghame Graham and Vice-Admiral Packer were reappointed in their present appointments.

Vice-Admiral Sir Harold T. C. Walker, K.C.B. (Retired), is promoted to Admiral on the Retired List (2nd September, 1948).

Rear-Admiral J. G. L. Dundas, C.B., C.B.E. (Retired), is promoted to Vice-Admiral on the Retired List (2nd September, 1948).

Rear-Admiral Sir Benjamin C. S. Martin, K.B.E., D.S.O. (Retired), is promoted to Vice-Admiral on the Retired List (2nd September, 1948).

Rear-Admiral H. Hickling, C.B., C.B.E., D.S.O. (Retired), is promoted to Vice-Admiral on the Retired List (2nd September, 1948).

Admiral Sir Louis H. K. Hamilton, K.C.B., D.S.O., is placed on the Retired List (26th September, 1948).

Vice-Admiral Sir Philip L. Vian, K.C.B., K.B.E., D.S.O., is promoted to Admiral (26th September, 1948).

Rear-Admiral R. D. Oliver, C.B., C.B.E., D.S.C., is placed on the Retired List and promoted to Vice-Admiral (Retired), (26th September, 1948).

Rear-Admiral A. R. M. Bridge, C.B., C.B.E., is promoted to Vice-Admiral (26th September, 1948).

Rear Admiral (S) Sir Malcolm G. S. Cull, K.C.B., C.B.E., M.V.O., is placed on the Retired List (4th August, 1948).

Surgeon Rear-Admiral J. A. O'Flynn, C.B., is placed on the Retired List (21st August, 1948).

Strengthening of Reserve Forces

Following on announcements of measures to strengthen the armed forces, the First Lord of the Admiralty—Viscount Hall—on 22nd September said that it was intended to set up a new Emergency Reserve consisting of men with previous service in the Royal Navy and Royal Marines who volunteered for immediate recall in the event of an emergency. Such volunteers would not have to undertake any training in peace-time; they would be screened by the Ministry of Labour to ensure that they could be released from civil employment when they were required. The First Lord also said that the Royal Navy was recruiting twice as many men for regular service as at any other period in peace-time.

On 23rd September, details of the needs of the various Reserve categories were supplemented by Vice-Admiral Sir Wilfrid Patterson, the Admiral Commanding Reserves, at a Press Conference held on board H.M.S. " President," headquarters training ship of the London Division, R.N.V.R. He explained that for ratings the Navy relies chiefly on the Royal Fleet Reserve, which consists of men who have had not less than three years in the Navy. This was formerly composed mainly of men who had signed on for seven years regular service to be followed by five in the R.F.R., but it is now also open to men who have served for not less than three years during or since the War. R.F.R. men draw a retainer of from 1s. a day, and do a week's training every other year. Some 17,000 are now enrolled, and the present intake is 700 a month, which it is hoped to increase to 1,000, no maximum number having been fixed.

The next most important source is the Royal Naval Volunteer Reserve organized in twelve Divisions. Its present strength is 3,000 officers and men, which includes four

air squadrons, but it is hoped to increase that figure to 15,000. Members are divided into two categories—List I, who live within reach of a Division Headquarters and can do evening training, and List II, who do only annual training of 14 days afloat. A separate branch is the R.N. Volunteer Wireless Reserve, who train in their own homes as well as at various centres, of which there will shortly be nearly 30 open. Some 1,250 officers and men of the R.N.V.(W.)R. are needed. Another separate branch is the Royal Marine Forces Volunteer Reserve, newly created, for which the first two depots are to be opened soon. The present requirement is for 1,500 officers and men, but this will increase.

For officers there is also the R.N.V. Supplementary Reserve, who do no training, except what they organize for themselves, but who undertake to come up for service when called on. This was in existence before the War; it is now open to those who held temporary Commissions during the War and have since been released.

Corresponding to this for ratings is the new Royal Naval Emergency Reserve—R.N.E.R.—with its counterpart for the Marines—R.M.E.R.—consisting of ex-naval ratings and Marines who are willing to serve if called on in an emergency. The figure for the Naval and Marine Emergency Reserves combined is 50,000.

The matter of the old-established Royal Naval Reserve, which consists of officers and men of the Merchant Navy, is not so easy to settle, since it is bound up with the war-time organization of the Mercantile Marine. Meanwhile, though the Reserve is in a state of suspended animation, one-third of the existing 1,600 R.N.R. officers who are eligible to enrol have already done so.

There is now a Women's Royal Naval Reserve, consisting of former officers and ratings of the Wrens with not less than a year's service who are willing to serve in emergency. Present numbers are 1,060 officers and 2,150 Wrens; 10,000 in all are wanted.

Since no definite maximum has been fixed for the officers in the R.N.V.S.R. or men in the R.F.R., it is not possible to state a single figure for the increases in the Reserves now being made. Apart from these two categories, the Admiralty aims at some 65,000.

It has also been announced that the programme for refitting ships in reserve is being speeded up, partly in the Royal Dockyards and partly by contract. Since the War the Royal Dockyards have been carrying out a certain amount of commercial work, but they will now revert to their proper function and will give high priority to refitting a number of ships in the Reserve Fleet.

Personnel

Air Pilots and Observers.—Details were announced on 1st October of the Admiralty's new scheme for the recruitment of naval air pilots and observers. The age limits will be 17 years 8 months to 20 years, and successful candidates will be entered as Naval Cadets and promoted to Midshipmen after six months and to Sub-Lieutenant after about two years total training. The period for promotion to Lieutenant will depend on the results obtained in courses. They will serve eight years on the Active List, followed by seven years on the Emergency List. Some will have opportunities of transferring to permanent Commissions. Those who leave the Active List after eight years service will be paid a gratuity of £700 free of tax. The first entry will be made in January, 1949; the closing date of applications for this was 15th October.

It appears that the policy of employing Petty Officer air pilots has been abandoned.

Electrical Branch.—The Electrical Branch of the Royal Navy is offering a limited number of Commissions to university graduates. Selections will be made from graduates between the ages of 21 and 25 who have satisfactorily completed a three years course in electrical engineering and have reached honours degree standard. Inquiries should be addressed to the Secretary of the Admiralty (C.W. Branch), London, S.W.1.

Roman Catholic Chaplains.—Cardinal Griffin, Archbishop of Westminster, on 24th August presented a carved teak plaque to officers of H.M.S. "Anson" for installation in the ship's Roman Catholic Chapel—the first Chapel of its kind in any ship of the Royal

Navy. At the same time Cardinal Griffin announced that he had accepted an invitation to become an Honorary Chaplain in the Royal Naval Volunteer Reserve. He is the first Cardinal or Archbishop of Westminster to hold such an office. No Roman Catholic Archbishop has ever before been an Honorary Chaplain, so that the additional appointments of the Archbishops of Liverpool and Edinburgh to similar offices in their respective Divisions are also a break with previous custom.

Material

New Destroyer.—H.M.S. " Broadsword," fourth ship of her class, has been accepted into service. She has been built and engined by Messrs. Yarrow and Company, Limited, of Scotstoun, and is fitted as a destroyer leader. She has an overall length of 365 ft.; breadth 38 ft.; and draught 12 ft. 7 in. Her armament consists of four 4-in. guns, six smaller guns, and two Pentad above-water torpedo tubes. Her peace-time complement is 256. The " Broadsword " is to join the Sixth Destroyer Flotilla.

Gas Turbine Unit.—The first craft with gas turbine propulsion—M.G.B. 2009—some particulars of the trials of which were given in the August Journal, left Gosport on 27th July for the Thames, where she was available for inspection by Members of Parliament.

H.M.S. " Renown."—The battle cruiser " Renown "—last of her class—left Plymouth on 3rd August, towed by ocean-going tugs, to be broken up by Metal Industries, Ltd., at Gareloch. The " Renown," launched in 1916, took the Prince of Wales on his world tours in 1919–22, and the King and Queen, then Duke and Duchess of York, to Australia and New Zealand in 1927. In the War she fought the " Scharnhorst " off Narvik in 1940, helped in the chase of the " Bismarck " in 1941, and brought Mr. Churchill from America in 1943. In 1945 the King met President Truman on board her in Plymouth Sound.

Destroyers for Dominica.—It was announced on 23rd September that negotiations had been concluded with the Dominican Government for the purchase of the destroyers " Fame " and " Hotspur." The " Hotspur " was due to sail for Dominica on 5th November, and the " Fame " in December.

Submarines for Portugal.—The submarine " Spearhead," which has been acquired by the Portuguese Navy and renamed the " Neptuno," left Portsmouth on 4th October for Lisbon. Two other submarines, the " Saga " and the " Spur," have also been acquired by Portugal.

H.M.S. " Worcester," the famous old wooden training ship built in 1839 and loaned by the Admiralty in 1876 to the Thames Nautical Training College, has now been sold for breaking up. Her place as a training ship has been taken by the " Exmouth," built as a training ship and lent by the Ministry of Transport.

Exercises and Cruises

Home Fleet.—The Home Fleet left Portland on 23rd September on its Autumn cruise. The battleship " Duke of York," wearing the flag of the Commander-in-Chief—Admiral Sir Rhoderick McGrigor, K.C.B., D.S.O., had on board the First Lord—Viscount Hall, Sir John Lang, K.C.B.—Permanent Secretary, and Rear-Admiral P. B. R. W. William-Powlett, C.B.E., D.S.O.—Naval Secretary. The First Lord and his party took passage to Trinidad and returned by air. The Fleet also included three aircraft carriers—the " Theseus," " Vengeance " and " Illustrious "; three cruisers—the " Diadem," " Cleopatra " and " Sirius "; and a number of destroyers, frigates and auxiliary vessels. For the first three days of the voyage exercises took place in which a detachment of Coastal Forces, comprising the First and Second Motor Torpedo Boat Flotillas, and aircraft of the Fleet and of the R.A.F. Bomber and Coastal Commands took part. Later the " Illustrious " and some of the smaller craft returned to home ports while the main fleet proceeded on its cruise—the " Duke of York," the three cruisers and attendant destroyers to the West Indies, the aircraft carriers " Theseus " and " Vengeance " with destroyers to South Africa, and destroyers to West African ports.

MEDITERRANEAN.—Units of the Mediterranean Fleet left Malta on 7th September for the second Summer cruise. The first cruise had been to the Levant. The second was to ports in France, Italy, Sicily, Tunisia, Algeria, Sardinia and Corsica. Admiral Sir Arthur Power, G.B.E., K.C.B., the Commander-in-Chief, flew his flag in H.M.S. "Surprise."

FAR EAST.—The cruiser "London," wearing the flag of Admiral Sir Denis Boyd, K.C.B., C.B.E., D.S.O., Commander-in-Chief, British Pacific Fleet, left Hong Kong on 21st July, for a cruise in Japanese waters. In company were the cruiser "Sussex," the destroyers "Cossack," "Consort," "Constance" and "Comus," and the sloop "Hart," which also visited Japanese ports, returning to Hong Kong in September. (*See also* "Organization.")

AMERICA AND WEST INDIES.—Units of the America and West Indies Squadron made a Summer cruise between July and October to ports on the Pacific Coast of Canada and the United States. The cruiser "Sheffield," wearing the flag of Vice-Admiral Sir William Tennant, K.C.B., C.B.E., Commander-in-Chief, visited Esquimalt, Vancouver, Comox, Seattle and San Francisco, among other ports. During a visit to Acapulco, the Commander-in-Chief and a party of officers and ratings went to Mexico City. The sloop "Snipe," Commander C. G. Walker, took Lord Baldwin—Governor of the Leeward Islands, on a tour of the islands. The church in which Lord Nelson was married at Nevis was visited. At the Governor's request, a landing was made at Dead Man's Chest by 15 men with a bottle of rum. No treasure was found, but two gravestones were observed. (Dead Man's Chest is an islet in the Virgin Group.)

TRAINING SQUADRON.—Ships of the Training Squadron from Portland made a nine days' cruise in the Channel from 13th to 23rd October. Led by the "Anson," flagship of Rear-Admiral E. W. Anstice, the Squadron proceeded to Portsmouth, where the "King George V" was due for refit. The flagship and aircraft carrier "Victorious" continued the cruise, calling at Torquay, Penzance and Falmouth.

ORGANIZATION

FAR EAST.—The shore headquarters and headquarters staff of the Commander-in-Chief, British Pacific Fleet—Admiral Sir Denis Boyd, were transferred from Hong Kong to Singapore on 15th September, from which date the title of the Admiral became that of Commander-in-Chief, Far East Station. Hong Kong remains the operational training base of the station. The change has been made "in order to facilitate inter-Service co-operation in the Far East." The Flag Officer Commanding Fifth Cruiser Squadron—Rear-Admiral A. C. G. Madden, C.B., C.B.E., who succeeded Rear-Admiral R. D. Oliver, C.B., C.B.E., D.S.C., on 14th September, will deputize for the Commander-in-Chief at sea when the latter is at his shore headquarters in Singapore. Rear-Admiral Madden's title has been changed to Flag Officer Commanding Fifth Cruiser Squadron, and Flag Officer Second-in-Command, Far East Station.

AMERICA AND WEST INDIES.—The cruiser "Glasgow" left Portsmouth on 1st October for Portland, whence she was to proceed to the America and West Indies Station for service as flagship, in place of the "Sheffield," which had been away from the United Kingdom for over two years.

H.M.S. "AFFRAY."—The submarine "Affray" returned to Portsmouth on 25th September after an absence of two years, during which she had travelled 51,000 miles and had visited India, Ceylon, Singapore, Borneo, the Solomon Islands, Hong Kong, Australia and South Africa. On her way home she made a brief stay with the Mediterranean Fleet.

NEW DIVING RECORD

The Admiralty has announced that Petty Officer Diver William Bollard, of Leicester, on 28th August reached a depth of 535 ft. in Loch Fyne, where H.M. submarine rescue-ship, H.M.S. "Reclaim," Commander W. D. Shelford, R.N., had been carrying out experimental deep dives. The dive, which was made in an Admiralty flexible deep diving suit,

is believed to be the deepest yet made in this form of dress. The record was set up at Garvel Point, Tarbert. P.O. Bollard descended to 535 ft. at 9.29 a.m., but it was not until 4.45 p.m., when he had been raised to the surface, that he was permitted to leave a decompression chamber. The object of the experiment was to perfect a diving suit in which rescuers can work comfortably at the crash dive depth of submarines. The former record—a dive of 440 ft., was held by America. It was broken by another member of the diving team, Petty Officer W. Soper, of Colchester, who during the day reached a depth of 451 ft.

Surgeon Lieutenant-Commander W. M. Davidson, R.N., of Belfast, and Surgeon Lieutenant D. W. H. Barnes, R.N.V.R., of North Finchley, London, carried out medical research for the purpose of the tests.

Naval Aviation

Battle of Britain.—To commemorate the part played by Royal Naval pilots in the Battle of Britain in 1940, twelve naval aircraft took part in the Fly Past over London on 15th September. The aircraft were six torpedo-carrying " Firebrands " from the R.N. Air Station, Anthorn, Cumberland, and six " Seafire " fighters from Lee-on-Solent. Some 40 pilots under training at the R.N. Fighter School, H.M.S. " Raven," volunteered to fly with the R.A.F. during the Battle of Britain, and a similar number of torpedo-bomber reconnaissance pilots served with R.A.F. bomber Squadrons. In addition, two squadrons of " Skuas," four of " Swordfish " and one of " Albacores " were lent to Coastal Command at the time of the invasion of the Low Countries and some of these squadrons continued in this duty during the Battle of Britain period.

U.S. and Canadian Displays.—Nine British aircraft, five belonging to No. 806 Naval Air Squadron and four to the R.A.F., took part with nearly 900 American warplanes in the ceremony of dedicating the New York international airport at Idlewild early in August. No. 806 Squadron afterwards took part in the Canadian National Exhibition at Toronto until 11th September. Rear-Admiral the Mackintosh of Mackintosh, C.B., D.S.O., Vice-Controller (Air) and Chief of Naval Air Equipment, congratulated the Squadron on an " exceptionally fine and polished display " in New York, adding: " You made a profound impression on 200,000 people who saw your show."

Women's Royal Naval Service

New Nursing Service.—The Women's Royal Naval Service is to have its own Sick Berth Attendants. Wrens are to be gradually recruited to replace V.A.D's who now carry out nursing duties in all places where W.R.N.S. are serving at home and abroad. As the new branch grows, W.R.N.S. Sick Berth Attendants will also relieve male Sick Berth Attendants in naval establishments when required to do so by the Medical Director-General of the Navy. The primary duties of the Sick Berth W.R.N.S. will be: (*a*) to nurse sick W.R.N.S. personnel; and (*b*) to nurse sick members of naval families. Recruits between the ages of 18 and 25 will be entered as probationary Sick Berth Attendants, and in cases where candidates have special qualifications the age limit may be extended to 30. They will do their basic training at H.M. Training Establishment " Dauntless," Burghfield, near Reading, followed by 20 weeks' training at the R.N. Hospital, Chatham, and six months in one of the main naval hospitals. Owing to the shortage of sick berth staff, the services of V.A.D's will still be needed for a considerable time, and they will eventually have the opportunity of joining the W.R.N.S. as Sick Berth Attendants. They will also continue to serve abroad in places where W.R.N.S. personnel are not at present based.

Wrens for Middle East.—The first draft of 24 members of the W.R.N.S. for the Middle East since the end of the War left Liverpool on 26th October in the " Empress of Australia." Composed mainly of communication Wrens, they sailed for Port Said, where they will be on the staff of the Senior British Naval Officer, Middle East.

Drivers.—There are vacancies for drivers in the motor transport branches of the W.R.N.S. Applicants, who must be trained drivers and in possession of a clean driving licence, should apply to the Director, W.R.N.S., Queen Anne's Mansions, London, S.W.1.

ROYAL MARINES

COMMANDANT-GENERAL.—The Admiralty announced on 26th July that Major-General (Acting Lieutenant-General) Sir Leslie C. Hollis, K.B.E., C.B., is to be Commandant-General, Royal Marines, in succession to General Sir Reginald A. D. Brooks, K.C.B., C.M.G., D.S.O., the appointment to take effect about April, 1949.

RETIREMENT AND PROMOTION.—Major-General H. T. Newman, C.B., C.B.E., Commanding the Portsmouth Group, Royal Marines, has been placed on the Retired List, to date 1st November, 1948. Colonel J. E. Leech-Porter, C.B.E., A.D.C., Commanding the Depot, Royal Marines, Deal, is promoted Major-General, to date 1st November, 1948.

R.M. ASSOCIATION.—Members of the Royal Marines Association, in mufti, and some United States Marines, in uniform, gathered on 29th July at 5, Talbot Square, Paddington, for the opening of the Association's new centre by Rear-Admiral the Earl Mountbatten of Burma. Although only formed at the beginning of 1946, the Association, stated the President—Major-General R. H. Campbell, had already 30,000 paid-up members in 155 branches all over the world. The cost of the centre, which has sleeping accommodation for 30 persons, was £17,000, towards which King George's Fund for Sailors has made a grant of £10,000 from money subscribed by South Africa.

DOMINIONS AND COLONIES

AUSTRALIA

NEW DESTROYERS.—On 20th August, the battle class destroyer " Anzac," of 3,300 tons, was launched at Williamstown Dockyard by Mrs. J. A. Collins, wife of Rear-Admiral Collins, First Naval Member of the Australian Naval Board. The naval programme contemplates the building of six destroyers of this class.

Five destroyers of the " Daring " class are also to be built for the Royal Australian Navy at an estimated cost of over £A5,000,000. Three will be built in Sydney and two in Melbourne.

BATTLESHIP BADGE.—A ship's badge, weighing one ton, from the superstructure of the battleship " Queen Elizabeth," now being broken up, has been shipped to Australia. It is the gift of the Admiralty to the Australian National War Memorial at Canberra, and will commemorate the part played by the " Queen Elizabeth " in the Gallipoli campaign, in 1915, in which many Australians lost their lives.

RECRUITS IN BRITAIN.—Over 500 ex-Royal Naval ratings had been recruited in the United Kingdom for service in the Royal Australian Navy by 7th August, or half the total stated to be needed when a recruiting scheme was announced by the Commonwealth authorities in London in July. Many of the recruits served in Australia with the British Pacific Fleet during the War, and some of them have Australian wives and friends. An Australian naval representative stated in August that recruitment in the seaman and telegraphist branches had been excellent, but there was still need for writers, cooks, stewards, and electrical and stores ratings. Those who enlist will have an opportunity of settling in Australia on completion of six years' service.

NAVAL AVIATION.—Over 900 officers and men of the Royal Australian Navy arrived at Devonport on 30th July in H.M.A.S. " Kanimbla," a landing ship (infantry), which took part in amphibious operations during the War in the Pacific. In addition to the crew there were 635 officers and men who are taking up naval aviation duties in the United Kingdom. About 450 of them will help to man the 14,000-ton light fleet carrier " Terrible," which is due to commission as H.M.A.S. " Sydney." The others are taking naval aviation courses. An R.N. carrier air component of ex-R.N. ratings, recruited in the United Kingdom for service in the Royal Australian Navy, will also help to man the " Terrible."

NEW ZEALAND

NEW FRIGATES.—Four of the six " Loch " class frigates to be transferred from the Royal Navy to the Royal New Zealand Navy have been handed over to the High

Commissioner for New Zealand in London, the Right Hon. W. J. Jordan. The "Loch Shin" and "Loch Achanalt" were handed over by the Commander-in-Chief, The Nore, on 13th September, and renamed the "Taupo" and "Pukaki," respectively. The "Loch Achray" was handed over by the Commander-in-Chief, Portsmouth, on 28th September, and renamed "Kaniere." The "Loch Eck" was handed over by the Commander-in-Chief, Devonport, on 1st October and renamed "Hawea." The ships sailed for New Zealand on 15th October. Two more, the "Loch Katrine" and "Loch Morlich" will be handed over in the spring of 1949.

CANADA

CARRIER EXERCISES.—The aircraft carrier "Magnificent," commissioned for the Royal Canadian Navy at Belfast on 7th April last, made a "shake-down" cruise off the coast of Nova Scotia in August in preparation for naval exercises in the North in which Royal Canadian Navy vessels penetrated Hudson Bay waters for the first time. The "Magnificent" sailed for Hudson Strait on 1st September, accompanied by the destroyers "Nootka" and "Haida." She went as far North as Wakeham Bay, near the upper end of Hudson Strait, whence on 12th September the destroyers went on to Churchill and Coral Harbour, on Southampton Island, while the carrier turned southwards for Halifax. The three ships carried out air and naval exercises. Their visit to Wakeham Bay was an eventful one for the small community there; a solitary missionary and about 80 Eskimos welcomed the visitors.

NAVAL ADVISER.—Captain R. L. B. Cunliffe, R.N., left Ottawa on 13th August for England on completion of his term of service as Naval Adviser to the British High Commissioner in Canada. He was due to be succeeded by Captain Sir Robert Stirling-Hamilton, R.N.

INDIA

FLAGSHIP ARRIVES.—The Prime Minister—Pandit Nehru, accompanied by the Defence Minister—Sardar Baldev Singh, and by the Governor and Premier of Bombay and the Chief Justice of Bombay, boarded H.M.I.S. "Delhi" (formerly H.M.S. "Achilles") at Ballard Pier, Bombay, on 15th September. On the previous day, the "Delhi" had assumed her role as flagship of the Royal Indian Navy officially when Rear-Admiral J. T. S. Ahll, R.I.N., went on board 180 miles out to sea and hoisted his flag as Rear-Admiral Afloat, Royal Indian Navy.

NEW DESTROYERS.—At a Press conference at Bombay on 16th September, Vice-Admiral W. E. Parry, the Commander-in-Chief, stated that the Royal Indian Navy was to be reinforced by three modern British destroyers, the "Rotherham," "Redoubt" and "Raider."

PAKISTAN

FLAGSHIP AT PORTSMOUTH.—The anti-aircraft frigate "Jhelum," Commander A. Rashid, flagship of the Royal Pakistan Navy, arrived at Portsmouth on 31st August. She brought 200 officers and men in addition to the 150 officers and men of her own complement who will commission two destroyers which Pakistan is to take over from the Royal Navy. The "Jhelum" went on to Southampton to refit. She is expected to remain for about six months, during which time her officers and men and those for the two destroyers will attend instructional schools at Portsmouth.

EAST AFRICA

NEW NAVAL FORCE.—An East African Naval Force is being formed on a regular full-time basis. The High Commission, consisting of the Governors of the three mainland territories, had conferred with the Commander-in-Chief, East Indies, Vice-Admiral Sir Charles Woodhouse, K.C.B., during the visit of H.M.S. "Birmingham" to Mombasa, and directions were given that detailed estimates of the recurrent costs should be prepared immediately for submission to the territorial legislatures. Legislation establishing the

Force is being prepared for introduction in the Central Legislative Assembly early next year, if by then the legislatures have agreed to provide the annual recurrent costs of the Force. The Admiralty is being approached with regard to the provision of suitable craft. The depot, which is likely to be at Mombasa, will be called H.M. East African ship "Mvita" —the Swahili word for war.

FOREIGN NAVIES

FRANCE

SURRENDER OF ITALIAN SHIPS.—France has at length acquired the greater part of her share of the Italian navy due to her under the terms of the Peace Treaty. Three small cruisers—the "Attilio Regolo," "Pompeo Magno," and "Scipione Africano"; four destroyers; two motor torpedo-boats; six tugs; and two water carriers have been surrendered.

NEW CONSTRUCTION.—A 16,700 ton aircraft carrier, known at present as PA-28, was due to be laid down before the end of the present year. It is understood that she is designed for a speed of 32 knots and to carry 49 aircraft.

The battleship "Jean-Bart" was due to receive the last two heavy guns, required to complete her main armament, this Autumn. On commissioning, the "Jean-Bart" will relieve the "Richelieu" in the Intervention Force, to enable the latter ship to be refitted.

RUSSIA

NEW ACQUISITIONS.—The former German pocket battleship, "Lutzow" (of which there is a fine model in the R.U.S. Museum) was refloated by the Russians last year, and it is believed that she is being refitted as a gunnery training ship for service with the Baltic fleet.

The 15,000 ton cruiser "Seydlitz," which fell into Russian hands at Königsberg (now Kaliningrad), is probably being rearmed with ten 7.1 in. guns in four turrets—"A" and "Y" being triple, "B" and "X" twin. This would be in line with what was done in the case of her sister-ship, now the "Petropavlovsk," acquired by arrangement with Germany in 1940. It is reported that the "Seydlitz" has been renamed "Poltava."

According to an American report, Russia has built and is building a large number of 250 ton submarines of a late-war German design. It is known that many of these craft in a practically finished state fell into Soviet hands when Elbing was captured, as did complete drawings and a number of sets of engines. There is good reason to believe that submarine experts of the ex-German navy have been pressed into Russian service.

It is also reported that midget submarines of the "Seehund" type are being built at Kronstadt, Nikolaiev, Odessa, and possible other ports.

ITALIAN WARSHIPS.—Italy has been pressed by Russia to speed up the surrender of the warships allotted her under the terms of the Peace Treaty. These include the battleship "Giulio Cesare," the 6-in. cruiser "Duca d'Aosta," and other smaller units. The delay has been attributed to the need for essential repairs.

Meanwhile Russia continues to hold on to the British battleship "ex-Royal Sovereign" and the U.S.S. cruiser "ex-Milwaukee," which are due to be returned before delivery of the Italian ships.

UNITED STATES

FLEET PLAN FOR 1949.—The following is the plan for operation of U.S. warships in the fiscal year 1949:—

Atlantic Fleet (including naval forces in Europe and Mediterranean):—
Ships manned 65 to 76 per cent. of wartime complement:—
6 carriers; 4 escort carriers; 12 cruisers; 53 destroyers; 41 submarines; 3 destroyer escorts; amphibious "lift" for two regimental combat teams.

Ships manned with reduced complements for training of Reserves, etc. :—
2 light carriers; 1 battleship; 4 cruisers; 18 destroyers; 5 destroyer escorts.

Pacific Fleet (including naval forces in Far East and Western Pacific) :—
Ships manned 65 to 76 per cent. of wartime complement :—
5 carriers; 3 escort carriers; 15 cruisers; 48 destroyers; 35 submarines; 5 destroyer escorts; amphibious " lift " for two regimental combat teams.

Ships manned with reduced complements for training of Reserves, etc. :—
1 battleship; 16 destroyers.

In addition to the foregoing, the U.S. Navy is maintaining a " mothball " (laid up) fleet of 1,970 vessels, including some 664 major types of warships.

NEW CARRIERS.—The 65,000 ton aircraft carrier, construction of which has caused some controversy, is to be laid down by a private yard—the Newport News Shipbuilding and Drydock Company, before the end of this year, It is expected that she will take four to five years to build and will cost $124,468,000.

She will be 1,030 ft. long on the waterline—130 feet longer than the " Medway " class—and 1,090 ft. overall. Her waterline beam will be 130 feet, with a normal maximum of 190 feet, which can be increased to 236 ft. by hinged extensions.

The engines are expected to develop 280,000 horsepower and give a speed of 33 knots. The armament is described as " heavy."

This carrier will be capable of carrying 24 fifty-ton four-engine bombers with an operating radius of about 1,700 miles. These aircraft will be capable of carrying atom bombs.

The carrier " Oriskany," of the 27,100 ton " Essex " class, construction of which has been delayed, is now due for completion in late 1949 or early 1950. Modifications introduced include larger elevators, better catapults, and stronger flight deck to enable her to handle larger aircraft.

HEAVY CRUISERS.—The 17,000 ton heavy cruisers " Des Moines," " Newport News," and " Salem," due for completion in November, 1948, February, 1949, and May, 1949, respectively, will carry nine rapid-fire 8 in. 55 calibre guns mounted in " fully automatic " turrets and using case ammunition, also a dozen 5 in. A.A. guns. They will have a single tall funnel and be rather heavily armoured for ships of their class.

OTHER NEW CONSTRUCTION.—Ships building or completing include :—

Two 14,700 ton light cruisers—the " Worcester " and " Roanoke," mounting twelve dual purpose 6 in. guns in twin turrets.

Two " Killer " ships of 5,500 to 7,000 tons specially equipped with the latest anti-submarine devices.

Four 2,500 ton destroyers with improved armaments.

Fourteen submarines, expected to have a submerged speed of over 17 knots, and to be fitted with the *schnorkel.*

ORDERS FOR PRIVATE YARDS.—It is understood that it is the policy of the Navy Department to place most orders for new construction with private yards. This has been adopted because " since the War there has not been a sufficient backlog of work [in these yards] to occupy their personnel and maintain their vital shipbuilding skills," whereas the Navy Yards have been kept busy with ship repairs and overhauls.

CONSTRUCTION SUSPENDED.—Work on thirteen ships—carry-over of the war-time programme—has been halted. They include the battleship " Kentucky " and battle cruiser " Hawaii "—69 and 82 per cent. completed respectively. These are designed to be " missile ships " when the new armament is available. The remainder are two destroyer escorts, seven destroyers, and two submarines.

END OF THE "NEW YORK."—The old battleship "New York," which had survived two major wars and two atom-bomb trials, was sunk in the Pacific forty miles from Pearl Harbour after being used as a target for shell and bomb practices on 9th July.

Other old ships which have also met their end in a similar way are the battleship "Nevada," the cruiser "Salt Lake City," and the "Ol Maru."

NAVAL HELICOPTERS.—It is intended to equip all battleships and cruisers with permanent helicopter platforms as soon as practicable, and all float-plane aircraft will be replaced in these ships by helicopters.

Orders have been placed with Sikorsky and Bell for 125 of these aircraft. They are credited with a ceiling of 19,000 ft. and a speed of 95 knots.

Helicopters have superseded destroyers for "plane-guard" duty with carriers; it having been demonstrated repeatedly that for air/sea rescue work they are much quicker and more certain than the surface craft.

GUIDED-MISSILE TESTING CENTRE.—Point Mugu, California, has been acquired by the Navy Department as a guided missile testing centre. The first part of the programme, due to start in October of this year, is to cost $14,000,000. The estimated cost of equipping the site is $30,000,000. From this base rockets and other pilotless projectiles can be "tested in flight over the ocean."

VISIT TO INDIA AND PAKISTAN.—A good-will visit to the two new Dominions was paid, during the Summer, by the U.S.S. heavy cruiser "Toledo," flagship of Rear-Admiral Roscoe F. Good, and the destroyers "Chevalier" and "Higbee." Admiral Richard L. Conolly flew from London to Karachi to join the squadron for the occasion.

ARMY NOTES

GREAT BRITAIN

H.M. The King

The King visited Bourley Camp, Aldershot, on 3rd August and inspected detachments of the Junior Training Corps and Army Cadet Force.

The King, on 31st October, reviewed in Hyde Park a representative parade of the newly constituted Territorial Army, with women of the Auxiliary Territorial Service. Contingents from all parts of Great Britain and from Northern Ireland were on parade, and the total number was about 8,000, including about 800 of the A.T.S. . Boys of the Army Cadet Force lined the parade ground during the King's preliminary inspection.

The Princess Royal, Colonel-in-Chief, took the Salute at a March Past of the 2nd Battalion, The West Yorkshire Regiment, in York on 16th August, and subsequently attended a Service in the Minster for the laying up of the Colours of the Battalion.

The Duke of Gloucester, as Colonel-in-Chief, was present on 10th October at the ceremony of the Laying-up of the Colours of the 4th and 6th Battalions, The Gloucestershire Regiment in Bristol Cathedral.

The King has approved the following appointments :—

To be Aides-de-Camp to the King.—Colonel (temporary Brigadier) H. H. V. Christie, M.C., T.D., D.L. (19th February, 1948) ; Lieut-Colonel (hon. Brigadier) J. N. Tetley, D.S.O., T.D. (19th February, 1948) ; Colonel (temporary Brigadier) H. C. Whitaker, C.B.E., Royal Army Ordnance Corps (15th August, 1948) ; Colonel (temporary Brigadier) A. Smith, O.B.E., T.D., late R.A. (T.A.) (19th February, 1948) ; Colonel (temporary Brigadier) H. T. de B. Lipscomb (10th September, 1948).

To be Colonel Commandant.—Of the Royal Artillery, Major-General (hon. Lieut.-General) Sir Frederick E. Morgan, K.C.B. (24th June, 1948).

To be Colonel of a Regiment.—Of the 7th Queen's Own Hussars, R.A.C., Lieut.-Colonel T. A. Thornton, C.V.O. (31st May, 1948).

Appointments

C.I.G.S.—General Sir William Slim, G.B.E., K.C.B., D.S.O., M.C., was appointed Chief of the Imperial General Staff in succession to Field-Marshal Viscount Montgomery of Alamein, K.G., G.C.B., D.S.O., to date 1st November, 1948. (See also General Service Notes.).

War Office.—Lieut.-General R. N. Gale, C.B., D.S.O., O.B.E., M.C., is to become Director-General of Military Training, War Office (February, 1949).

Major-General R. A. Hull, C.B., D.S.O., has been appointed Director of Staff Duties, War Office (September, 1948).

Major-General H. Redman, C.B., C.B.E., has been appointed Director of Military operations, War Office (September, 1948).

Colonel H. J. Higgins, O.B.E., F.D.S., R.C.S., late Royal Army Dental Corps, has been appointed Director, Army Dental Service (September, 1948).

Sir George Turner has been appointed Permanent Under-Secretary of State for War in succession to Sir Eric Speed, who is resigning on 31st December, 1948.

United Kingdom.—Lieut.-General G. H. A. MacMillan, C.B., C.B.E., D.S.O., M.C., is to become G.O.C.-in-C., Scottish Command (February, 1949).

Major-General P. M. Balfour, C.B., C.B.E., M.C., is to become G.O.C.-in-C., Northern Command (March, 1949).

Major-General A. D. Ward, C.B., C.B.E., D.S.O., has been appointed Commandant, Staff College, Camberley (September, 1948.)

Lieut.-General Sir Arthur Smith, K.C.B., K.B.E., D.S.O., M.C., has been appointed Lieutenant of the Tower of London (July, 1948) in succession to Major-General Sir John Kennedy, K.B.E., C.B., C.M.G., D.S.O.

The King has approved the appointment of a Controller Commandant for the Queen Alexandra's Imperial Military Nursing Service, and Dame Louisa J. Wilkinson, D.B.E., R.R.C., has become the first holder of this appointment, with effect from 27th July, 1948.

Lieut.-General O. L. Roberts, C.B., C.B.E., D.S.O., is to become G.O.C.-in-C. Southern Command (about July, 1949).

Major-General Sir Reginald F. S. Denning, K.B.E., C.B., is to become G.O.C. Northern Ireland District (about July, 1949).

FAR EAST LAND FORCES.—Brigadier J. M. Kirkman, C.B.E., has been appointed Chief of Staff, Far East Land Forces with the temporary rank of Major-General (September, 1948).

Lieut.-General Sir John Harding, K.C.B., C.B.E., D.S.O., M.C., is to become Commander-in-Chief, Far East Land Forces (about July, 1949).

BRITISH ARMY OF THE RHINE.—Major-General C. B. Callander, C.B., M.C., is to become G.O.C., 2nd Division, B.A.O.R. (February, 1949).

GERMANY.—Brigadier L. Wansbrough-Jones, C.B., C.B.E., has been appointed Deputy Chief of Staff (Organization), British Zone, Control Commission for Germany (British element), with the temporary rank of Major-General (October, 1948).

UNITED STATES.—General Sir Neil M. Ritchie, K.C.B., K.B.E., D.S.O., M.C., is to become Chairman and Commander, British Joint Services Mission, Washington (about July, 1949).

PROMOTIONS

The following promotions have been announced :—

Lieut.-Generals.—To be Lieut.-General :—Major-General Sir Arthur A. B. Dowler, K.B.E., C.B. (9th July, 1948, with seniority 20th December, 1944).

Major-Generals.—The following to be Major-Generals :—Colonel and Chief Paymaster (temporary Brigadier) C. N. Bednall, O.B.E., M.C. (28th August, 1948) ; Brigadier (temporary Major-General) J. A. Gascoigne, D.S.O. (9th July, 1948, with seniority 24th November, 1946) ; Brigadier (temporary Major-General) E. O. Herbert, C.B., C.B.E., D.S.O. (11th July, 1948) ; Colonel H. J. Higgins, O.B.E., F.D.S., late R.A.D.C. (1st September, 1948).

The following Brigadiers to be temporary Major-Generals :—H. M. Whitty, C.B., C.B.E. (15th July, 1948) ; E. A. B. Miller, D.S.O., M.C., A.D.C. (18th September, 1948).

The following Colonels (temporary Brigadiers) to be temporary Major-Generals :—J. M. Kirkman, C.B.E., (13th August, 1948) ; J. A. N. Swiney, C.B.E., M.C. (1st September, 1948) ; C. B. Fairbanks, C.B.E. (15th September, 1948) ; R. H. Bower, C.B.E. (15th September, 1948).

RETIREMENTS

The following General Officers have retired :—Major-General J. B. Macdonald, D.S.O., O.B.E. (18th July, 1948) ; Major-General Sir Harold R. Briggs, K.C.I.E., C.B., C.B.E., D.S.O. (7th July, 1948) ; Major-General B. W. Key, C.B., D.S.O., M.C. (19th June, 1948) ; Major-General H. L. Davies, C.B., C.B.E., D.S.O., M.C. (27th June, 1948) ; Lieut.-General Sir Frank W. Messervy, K.C.S.I., K.B.E., C.B., D.S.O., with hon. rank of General (22nd August, 1948) ; Major-General J. S. Ballentine, C.B., C.I.E. (22nd August, 1948) ; Major-General F. J. Walsh, C.B., C.B.E. (16th September, 1948) ; General Sir Rob. M. M. Lockhart, K.C.B., C.I.E., M.C. (1st October, 1948) ; Major-General D. C. Hawthorn, C.B., D.S.O. (31st May, 1948).

TERRITORIAL ARMY STRENGTH

The actual strength of the Territorial Army on 30th September, 1948, was :—

	Officers	*Other ranks*	*Total*
Territorial Army	7,951	41,342	49,293
„ „ (A.T.S.) ...	277	5,736	6,013
Active Army Cadre ...	1,349	3,293	4,642
„ „ (A.T.S.) ...	46	57	103
			60,051

MISCELLANEOUS

GIFT FROM CHILEAN ARMY.—A delegation from the Chilean Army, accompanied by the Chilean Minister-Counsellor, on 16th August, presented to Mr. Shinwell, Secretary of State for War, a bronze bust of General Bernardo O'Higgins, soldier and statesman (1776-1842). The bust was accompanied by a parchment in Spanish and English from the Chilean Commander-in-Chief.

Mr. Shinwell expressed his pleasure that the delegation had been able to visit Sandhurst during their stay for the Olympic Games.

THE PARACHUTE REGIMENT.—On 24th August the 16th Independent Parachute Company (Guards) provided the Guard at Buckingham Palace. This is the first time that a unit of The Parachute Regiment has been given this honour.

D.C.I.G.S. TO VISIT AUSTRALIA.—The Deputy Chief of the Imperial General Staff, Lieut.-General Sir Kenneth N. Crawford, K.C.B., M.C., will be visiting Australia this Autumn at the invitation of the Australian authorities and will be visiting the desert range. He is taking the opportunity on the way of seeing British troops stationed in the Middle East and in the Far East and of acquainting himself with conditions in those Commands.

PALACE GUARD.—After the departure of the 2nd Guards Brigade for Malaya, the 1st Battalion, The King's Shropshire Light Infantry shared in mounting guard at Buckingham Palace. From 1st October onwards, the 1st Battalion, The Middlesex Regiment also shared this honour, performing the duty on alternate days with the 1st Battalion, Welsh Guards and the 1st Battalion, The King's Shropshire Light Infantry.

CADETS NATIONAL RIFLE MEETING.—The first national rifle meeting for Cadets took place at Bisley during the first week-end in October. There were nearly 600 competitors from the Army Cadet Force, the Air Training Corps and the Royal Marines Volunteer Cadet Corps.

DOMINIONS AND COLONIES

AUSTRALIA

H.M. THE KING

The King has approved the following appointment :—

TO BE HON. PHYSICIAN TO THE KING.—Colonel (temporary Major-General) F. K. Norris, C.B.E., D.S.O., E.D., M.D., B.S., Director-General of Medical Services, Australian Military Forces.

CANADA

H.M. THE KING

The King has approved the following appointment :—

TO BE AIDE-DE-CAMP GENERAL TO THE KING.—General H. D. G. Crerar, C.H., C.B., D.S.O., Canadian Army (23rd July, 1948).

ROLE OF THE CANADIAN ARMY.—Speaking on 24th June, 1948, the Canadian Minister of Defence stated that the Active Army is (*a*) to include a brigade group or later such additional force as may be considered necessary, trained and equipped to deal with any diversionary attack, and (*b*) to provide the staff to train the Reserve Army, and with it form the nucleus for as large a force as Canada may need.

NEW ZEALAND

H.M. The King

The King has approved the following appointments:—

To be Hon. Physician to the King.—Colonel R. D. King, C.B.E., D.S.O., M.D., M.R.C.P., F.R.A.C.P., Royal New Zealand Army Medical Corps (30th April, 1947).

To be Hon. Surgeon to the King.—Colonel (temporary Brigadier) W. H. B. Bull, O.B.E., E.D., M.B., Ch.B., F.R.C.S., Royal New Zealand Army Medical Corps (15th June, 1948).

INDIA

Extracts From a Letter

Below are quoted some extracts from a private letter written last August by a Lieut.-Colonel of the Army of the Dominion of India to a former British brother-officer. This Indian officer is now commanding an Infantry Regimental Training Centre. He is a graduate of the Staff College, Quetta, but has never been out of India.

"I need not go into the details of the task entrusted to me (i.e., command of a Regimental Centre); with your long experience you can well imagine what it must have involved. . . . Everything was new—the officers all new and even more raw than me (my Second-in-Command has less than six years' service); the men unused to us; the administrative, recruiting, accounting, etc., systems different from and more involved than those of other regiments, and as Centre Commander I had the task of co-ordinating the internal activities of three battalions where similar conditions of strange faces and new officers prevailed. However, everything has gone well and now, after seven months of unceasing hard work, I think I can say that the old ship is on an even keel. . . .

"Three main factors have sustained me during these months. Foremost is the constant support and utter devotion of all my officers and men; the manner in which the men have taken this 'upheaval' and the sincerity with which they have played up is a thing that I shall always treasure. . . . Then there has been the feeling of having been given a job worth doing, the more so because of its difficulties. And lastly—believe me, I am not saying this merely because it is good form to do so, but with a very true feeling of humble gratitude—all that I learnt whilst I had the privilege of serving under you has been of untold value to me in this job. . . .

"The present tension is most upsetting. It is a thousand pities that various unfortunate events should have overtaken both the Dominions in their infancy. I only hope that they will not lead to anything serious, because I cannot see any future in any other attitude but one of trust and mutual friendship. . . .

"You will be glad to hear that the Indian Army as a whole has come through the trying times of last year with its honour, discipline and traditions of integrity intact. One would be foolish not to recognize the difficult years ahead, but I am convinced that all will be well in the end. I say this because my faith in the men has gone up tenfold after witnessing the magnificent way in which they have reacted to events during the past year. Besides, the quality of officer now being turned out by the Indian Military Academy is good. And those are the main components of an Army. The inanimate material, the machines, will gradually improve, but the man behind the gun is sound of mind and body. . . .

"As you will readily imagine, with the almost complete disappearance of British officers from the Indian Army, promotions have been extra rapid. . . . Command of a Regiment is one of the best periods in one's whole service, although I would have liked it to come in the fullness of time. However, one cannot help that in present circumstances. Taking a longer view, I'm sure too rapid promotion would be a bad thing in the end. I am not yet 34, and I don't want to be faced with retirement at too early an age. . . .

"Now I am pinning all hopes on getting a vacancy on the next course at the Joint Services Staff College in England. . . .

"Despite all the present-day talk about the medium of instruction in our Country, I am sending my two children to two schools where English is still the medium. I agree that they must learn their own language in order to imbibe their own culture fully—and Hindi is taught at both these schools. But I cannot bear any so-called national views, which are in reality extremely narrow and blind to facts. Besides, English is more or less the common language for the best part of the globe. . . ."

KENYA

THE KENYA REGIMENT.—The Governor of Kenya—Sir Philip Mitchell, addressing the annual gathering of European members of the 11th East African Division on 12th October, announced that the War Office and Colonial Office now agreed that preliminary steps could be taken at once for reforming The Kenya Regiment. This is a Territorial unit for Europeans, and its principal purpose is to provide trained leadership for African troops.

FOREIGN

FRANCE

General de Lattre de Tassigny, recently chosen by the Defence Ministers of the Brussels Powers to be Commander-in-Chief of the land forces of Western Union, has resigned from his present post of Inspector-General of the French armed forces in order, it is stated, to devote himself completely to his new task. Through his wider functions, however, he will continue to exercise an influence on the organization of the French forces as a whole.

PORTUGAL

General Barrof Rodriguez, Chief of the General Staff of the Portuguese Army, paid a visit to the United Kingdom from 9th to 16th October, as the guest of the British Government. During the course of his stay, General Rodriguez visited various British Army and R.A.F. establishments.

INDIAN ARMY MUSEUM

We have been requested to publish the following letter:—

For some time past the question of establishing a Museum to commemorate the British connection with the Indian Army has been exercising the attention of many British Officers who have served with the Indian Army.

The difficult problem of finding a suitable home for any mementos which may be forthcoming has had to be solved. The Commandant of the Royal Military Academy Sandhurst has now generously offered to provide suitable accommodation as a permanent home for a limited number of exhibits in the Academy.

Would officers and others interested in this matter who may have mementos, pictures, etc., connected with the history of the old Indian Army, which they would be willing to lend or present, communicate with the Commandant of the R.M.A. Sandhurst, Camberley, Surrey, and inform him of the nature of the presentation or loan. Space is necessarily limited and it may not be possible to accept all offers. For this reason, it will not be possible to display old uniforms, interesting as these may be.

We are confident that no better home for this collection could be found than at the Royal Military Academy, Sandhurst, where so large a proportion of the British officers of the old Indian Army were educated and where the great proportion of the officers of the British Army will be trained.

BIRDWOOD, F.M.
C. J. E. AUCHINLECK, F.M.

AIR NOTES

GREAT BRITAIN

H.M. The King

The King has approved the designation "His Majesty's Air Force Vessel" ("H.M.A.F.V.") for all ocean-going ships and sea-going craft of the 68-ft. launch class of the R.A.F.

The Secretary of State for Air—Mr. Arthur Henderson—informed the Captain of the "Sunderland" flying-boat headquarter's ship "Bridport" of this honour when visiting the ship at Waltershofer Haven, Hamburg, in the course of a tour of the Berlin air lift. The "Bridport" is a converted minesweeper, normally stationed at Portsmouth.

Appointments

The following were announced on 15th August :—

Air Vice-Marshal J. N. Boothman, C.B.E., D.F.C., to be Air Officer Commanding, Air Headquarters, Iraq, where he will take up the appointment in the Autumn.

Air Commodore C. B. R. Pelly, C.B.E., D.C., to be Assistant Chief of Air Staff (Technical Requirements), Air Ministry, with the acting rank of Air Vice-Marshal, to date 17th August.

On 8th September, the appointment was announced of Air Vice-Marshal W. L. Dawson, C.B., C.B.E., as Commandant of the School of Land/Air Warfare, Old Sarum, with effect from 18th October.

On 14th September, the appointment was announced of Air Commodore (Acting Air Vice-Marshal) F. J. W. Mellersh, as Air Officer in Charge of Administration, Air Command, Far East.

On 29th September, the appointment was announced of Air Vice-Marshal C. W. Weedon, C.B., C.B.E., as Senior Air Staff Officer, R.A.F. Technical Training Command, with effect from 19th October.

On 13th October, the following appointments were announced :—

Air Marshal Sir A. P. M. Sanders, K.B.E., C.B., to be Vice-Chief of Air Staff from 1st November, 1948.

Air Vice-Marshal T. M. Williams, C.B., O.B.E., D.C., to be Air Officer Commanding-in-Chief, British Forces of Occupation, Germany, with the acting rank of Air Marshal.

On 17th October, the appointment was announced of Air Vice-Marshal R. O. Jones, C.B., A.F.C., to be Senior Air Staff Officer, R.A.F. Reserve Command, with effect from 25th October.

On 21st October, the appointment was announced of Air Vice-Marshal S. D. Macdonald, C.B.E., D.F.C., as Assistant Chief of Air Staff (Training) in succession to Air Vice-Marshal Sir Basil E. Embry, K.B.E., C.B., D.F.C., A.F.C.

Air Commodores.—The following were announced at various dates :—

Air Commodore C. H. Flinn, C.B.E., to be Senior Air Staff Officer, No. 205 Group, Mediterranean and Middle East Command.

Air Commodore H. L. Patch, C.B.E., to be Officer Commanding, Aeroplane and Armament Experimental Establishment, Boscombe Down.

Group Captain (Acting Air Commodore) E. C. Hudleston, C.B., C.B.E., to be Head of the United Kingdom Military Delegation to the Western Union Military Staff Committee, with the acting rank of Air Vice-Marshal.

Air Commodore G. S. Shaw to be Senior Air Liaison Officer with the United Kingdom Service Liaison Staff, South Africa.

Group Captain E. W. Towsey, O.B.E., to be Command Defence Officer, Mediterranean and Middle East Command, with the acting rank of Air Commodore.

Air Commodore W. J. G. Walker, C.B.E. (Medical Branch), to be Principal Medical Officer, Flying Training Command.

Air Commodore H. V. Satterly, C.B.E., D.F.C., to be Assistant Commandant of the R.A.F. Staff College, Bracknell, Berkshire.

On 25th October, the appointment was announced of Air Commodore A. D. Davies, C.B.E., as Air Officer Commanding R.A.F., Hong Kong.

On 31st October, the following appointments were announced :—

Air Commodore (Acting Air Vice-Marshal) H. J. Roach, C.B., C.B.E., A.F.C., to be Air Officer Commanding No. 41 Group, Maintenance Command, retaining his acting rank, with effect from 1st November.

Air Commodore H. G. White, C.B.E., to be Air Officer Commanding No. 43 Group, Maintenance Command, with the acting rank of Air Vice-Marshal, with effect from 1st November.

IMPERIAL DEFENCE COLLEGE COURSE.—The following R.A.F. officers have been selected for the 1949 course at the Imperial Defence College :—

Air Commodore Sir Harry Broadhurst, K.B.E., C.B., D.S.O., Air Officer Commanding No. 61 (Eastern Reserve) Group.

Air Commodore the Earl of Bandon, C.B., D.S.O., Commandant, Royal Observer Corps.

Air Commodore F. J. Fressanges, C.B., Director of Operations, Air Ministry.

Air Commodore T. G. Pike, C.B., C.B.E., D.F.C., Director of Operational Requirements (A), Air Ministry.

Air Commodore H. D. Spreckley, O.B.E., Commandant, Empire Air Armament School.

Group Captain (Acting Air Commodore) A. W. B. McDonald, A.F.C., Commandant, R.A.F. Staff College, Andover.

Group Captain G. P. Chamberlain, C.B., O.B.E., Director of Civil Air Operations, Ministry of Civil Aviation.

Group Captain E. N. Lowe, C.B., C.B.E., Officer Commanding, No. 16 Maintenance Unit.

PROMOTIONS

On 12th October, the Air Ministry announced the following promotion :—

Air Marshal Sir James Milne Robb, K.B.E., C.B., D.S.O., D.F.C., A.F.C., to become Air Chief Marshal, with effect from 1st October, 1948, on his appointment as Air Commander-in-Chief, Air Forces Western Europe. (See also General Service Notes.)

Grant of Acting Rank :—

Air Vice-Marshal P. C. Livingston, C.B., C.B.E., A.F.C. (Medical Branch), is granted the acting rank of Air Marshal (1st July, 1948).

Air Vice-Marshal J. W. Jones, C.B., C.B.E., is granted the acting rank of Air Marshal (12th July, 1948) on taking up the appointment of Air Officer Commanding-in-Chief, Technical Training Command.

Air Commodore E. C. Hudleston, C.B., C.B.E., is granted the acting rank of Air Vice-Marshal (5th May, 1948).

Air Commodore D. A. Boyle, C.B., C.B.E., A.F.C., is granted the acting rank of Air Vice-Marshal (26th July, 1948).

Air Commodore C. B. R. Pelly, C.B.E., M.C., is granted the acting rank of Air Vice-Marshal (17th August, 1948).

Retirements

Air Marshal Sir Ralph S. Sorley, K.C.B., O.B.E., D.S.C., D.F.C. (at own request), (6th September, 1948).

Medical Branch.—Air Vice-Marshal A. F. Rook, K.B.E., C.B. (3rd July, 1948).

Air Vice-Marshal T. McClurkin (at own request), (1st September, 1948).

General Duties Branch.—Air Commodore H. A. Haines, C.B.E., D.F.C. (on account of medical unfitness for Air Force service), (17th July, 1948).

Group Captain A. D. Rogers, C.B.E., A.F.C., retaining the rank of Air Commodore (10th July, 1948).

Group Captain C. B. Wincott, C.B.E., retaining the rank of Air Commodore (14th September, 1948).

Technical Branch.—Group Captain F. G. H. Ewens (on account of medical unfitness for Air Force service), retaining the rank of Air Commodore (29th July, 1948).

Equipment Branch.—Group Captain H. S. F. T. Jerrard, retaining the rank of Air Commodore (26th August, 1948).

Secretarial Branch.—Group Captain T. C. Miller, M.C., retaining the rank of Air Commodore (18th July, 1948).

Honours and Awards

George Cross

The King has approved the award of the George Cross to :—

Flight Sergeant Stanley James Woodbridge (deceased), R.A.F. Volunteer Reserve, No. 159 Squadron.

Flight Sergeant Woodbridge was a wireless operator in a Liberator aircraft which crashed in the jungle in Burma whilst engaged in an operation against the Japanese on 31st January, 1945. Together with five other members of the crew he was captured by the Japanese. All six were subjected to torture at the hands of their captors in an endeavour to obtain information which would have been of use to the Japanese Intelligence Service. Eventually the four non-commissioned officers were separated and conveyed by motor transport to a forest, where they were put to death by beheading. Three officers and three non-commissioned officers of the Imperial Japanese Army were subsequently brought to trial by a Military Court, charged with the torture and murder of the four airmen. They were all found guilty. Three were hanged and three sentenced to terms of rigorous imprisonment.

At the trial it was revealed that the Japanese concentrated their efforts on Flight Sergeant Woodbridge, the wireless operator, in an endeavour to obtain technical information regarding wireless equipment, secret codes, wavelengths, etc. A Japanese technical officer was detailed to make the interrogation, and the services of two interpreters were engaged, but in spite of repeated torture, including kicking, beating with belts and with a sword, Flight Sergeant Woodbridge steadfastly refused to reveal any information whatever. The final interrogation took place actually at the place of execution, when it was obvious to the unfortunate prisoner that he was to be put to death; even so, he maintained his courageous attitude to the end. After all efforts to make him speak, including further torture, were found to be fruitless, this gallant non-commissioned officer was beheaded on 7th February, 1945. Flight Sergeant Woodbridge's fortitude, loyalty to his Country, and complete disregard for his own life, constitute one of the highest examples of valour in the annals of the Royal Air Force.

On 30th October, it was announced that the King had approved appointments and awards for distinguished service in Palestine, including the following :—

D.S.O.—Air Vice-Marshal W. L. Dawson, C.B., C.B.E.

O.B.E.—Acting Wing Commander V. C. F. Streatfeild.

A.F.C.—Squadron Leader C. F. Ambrose, D.F.C.

Air Ministry Organization

It was announced on 27th September that the Secretary of State for Air had appointed a Committee " to review the organization of the Air Ministry in the light of present-day requirements and to recommend what improvements are possible in the interests of efficiency and economy in manpower and money."

The members of the Committee include Marshal of the Royal Air Force Lord Douglas of Kirtleside.

Strengthening of the R.A.F.

A number of measures to strengthen the R.A.F. and its Reserves have been taken during the past quarter.

On 14th September it was announced in Parliament that all National Service men due for release in the next few months who had not already left their units for release would be retained for three months beyond their normal release date. Every effort was to be made to accelerate recruitment for the regular and auxiliary forces, to improve equipment, especially for air defence, armour and infantry, and the present rate of output of some fighters will be doubled. Older types of fighters in store will be re-conditioned. With regard to aircraft, we had to meet not only our own production needs, but also those of other countries, including members of Western Union who were using British types.

From Monday, 13th September, for the first time since before the end of the War, all five R.A.F. aircrew categories were re-opened for recruiting. Signallers, engineers and gunners were invited to volunteer as well as pilots and navigators. Many more commissions are to be available for pilots and navigators. All aircrew volunteers now sign on for eight years regular service in the first instance.

On 15th September, the Air Ministry announced a new offer to ex-R.A.F. and other men with flying experience to return to the Service for a period of eight years with further career prospects. For experienced pilots and navigators, whether ex-R.A.F. or not, who can begin flying duties at once, the upper age limit is raised to 30, and for signallers, engineers and gunners to 34. Those who have had some flying experience but have not progressed beyond the instruction stage, may be given accelerated training. These volunteers must normally be under 25, but suitable ones will be considered if older.

From 1st October, recruiting for ground trades of the R.A.F. Volunteer Reserve was reopened. Airwomen are being recruited for the first time for service with this Reserve. They will be known as the W.A.A.F.V.R. More than 17,000 men and women volunteers are required. At the start, only those who served with the R.A.F. or W.A.A.F. will be accepted, but recruiting will be extended later to men and women who have not previously served.

R.A.F. Supplementary List

On 23rd September, the Air Ministry announced the opening of the R.A.F. Supplementary List to former airmen and airwomen who are willing and ready to return to the Service at the very outset of an emergency. This will be their only obligation. They should write or apply to any R.A.F. Station or Recruiting Centre, to the Air Ministry (S.14 (a)), London, or to the Air Ministry Information Bureau, Kingsway, London. There was already a Supplementary List for former R.A.F. and W.A.A.F. officers.

The Supplementary List is for those who are not able to put in training in peace-time, but who have valuable experience and are now ready to register their willingness and readiness to rejoin. Those who join the Supplementary List may apply to join the Royal Auxiliary Air Force or the R.A.F. Volunteer Reserve at any time. These two forces need men and women who can spare a certain amount of time for training.

Vacancies for Women

A wider range of opportunity for service than ever existed before is afforded to women in the present Air Force recruiting campaign. The target figure for the Women's Auxiliary Air Force is 1,000 regular recruits a week, and those wishing to join on a part-time basis now have fifteen trades to choose from.

In the W.A.A.F.V.R., former W.A.A.F., officers are required for secretarial, intelligence, code and cypher, equipment, catering and aircraft control duties. Recruitment of airwomen for ground trades is now open for the first time, and there are openings for experienced women pilots.

Women are also required for the fighter control units of the Royal Auxiliary Air Force. The target for men and women in these units is 20,000, and it is hoped that about half this number will be women. The Royal Observer Corps, which is an important part of the Fighter Command reporting system, also needs many women recruits. Age limits are from 18 to 38 in the Fighter Control Units, and to 45 in the W.A.A.F.V.R.

The Berlin Air Lift

The Air Officer Commanding-in-Chief, British Air Forces of Occupation, Germany—Air Marshal Sir Arthur P. M. Sanders, K.B.E., C.B., on 6th October, issued a message to all officers, airmen and airwomen engaged on "Plain Fare," the R.A.F.'s operation in support of the Berlin air lift. He said:—

"After three months of negotiation there are still no signs of any lifting of the Berlin blockade. Until surface communications with the West are restored the air lift must go on. Moreover, with the approach of Winter it must be enlarged and intensified to provide more fuel and food. The vital importance of this cannot be exaggerated. Our American colleagues are stepping up their effort, and we must do the same whatever the cost to us as a Service or as individuals."

Air Exercises

All home-based operational commands of the R.A.F., as well as American bomber units in Britain, and aircraft from the British Air Forces of Occupation in Germany, took part in the biggest air defence exercise since the War, known as "Dagger," between 3rd and 6th September. The general idea imagined an enemy continental Power, "Southland," with a western coast-line joining Basle, Switzerland, to the Dutch island of Juist, and thence northward to a point halfway up the Norwegian coast, to be attacking "Northland"—an area which included the Midlands, East Anglia and South-East England. In command of the attacking forces was the A.O.C.-in-C., Bomber Command, Air Marshal A. B. Ellwood, C.B., D.S.C.; and "Northland's" air forces were under the A.O.C.-in-C., Fighter Command, Air Marshal Sir William Elliot, K.B.E., C.B., D.F.C.

Aircraft of R.A.F. Bomber and Coastal Commands took part in the Home Fleet exercise in the English Channel and the South-Western Approaches between 23rd and 25th September, at the beginning of the Fleet's autumn cruise.

Exercises of the Royal Observer Corps took place on 25th July and 15th August. In the former, about 100 aircraft took part, and the Fighter Command raid reporting system was manned. In the latter, about 450 members of the Corps competed in estimating the varying heights and speeds at which aircraft flew over the R.A.F. Station at Stradishall, Suffolk.

Battle of Britain Anniversary

The eighth anniversary of the Battle of Britain in 1940 was commemorated in the week from 12th to 19th September. The chief event of the week was the flight of some 200 service aircraft—British and American—over London on 15th September. A solitary "Hurricane," in remembrance of the fighter aircraft and pilots in the Battle, flew between the massed British and American heavy bombers.

On the Horse Guards Parade there were displayed four aircraft, a "Hurricane" and a "Spitfire," both survivors from the Battle, and jet-propelled "Vampire I" and "Meteor IV" aircraft of the present day.

On Saturday, 18th September, 82 service airfields were open to the public, and a total of 557,650 people watched the displays which took place at most of them.

On Sunday, 19th September, a service of thanksgiving was held in Westminster Abbey, at which the Rev. Dr. J. A. Jagoe, C.B.E., Chaplain-in-Chief R.A.F., was the preacher. Members of the Air Council attended, and after the service Lord Tedder, Chief of the Air Staff, placed a wreath of poppies from all ranks of the R.A.F. on the Air Force memorial on the Thames Embankment.

Personnel

Working Week.—It was announced on 29th August that the R.A.F. working week has been fixed at the minimum of 44 hours, including all official Service activities, rising to a 47-hour week, depending on local and seasonal conditions. On the basis of the 44-hour week, nine hours are allowed for such needs as parades, ground combat training, compulsory sport, some education, and the like, which fall to a man as an airman as distinct from a tradesman. One and a half hours are allowed for breaks, leaving 33½ hours as the minimum time at tradesmen's work. If a man cannot be fully employed at his own trade during this minimum working time due to lack of balance between trades at present, he is to be employed on other duties to the best advantage. This follows a review of the subject by the Air Council and will be used as the basis for all manpower planning in the R.A.F.

Nurses by Parachute.—The first R.A.F. parachute medical team, including four volunteer nursing sisters, parachuted from a "Dakota" on 7th October at Upper Heyford in a demonstration of how first-aid can be sent by air to casualties who cannot be reached quickly from the ground. Air Marshal P. C. Livingston, C.B., C.B.E., Director-General of R.A.F. Medical Services, who was present, said that he hoped to train a parachute medical team every three months until a full hospital staff had been built up.

Missing Research Unit Disbands.—No. 5 Missing Research and Enquiry Unit, which had for three years been tracing the fate of British airmen lost on war-time flights over Italy, the Mediterranean, Austria, Hungary, the Balkans and the Near East, has now been disbanded, having completed its task as far as is possible. By 1st July, 1948, 19,756 men of the R.A.F., Dominions, and Allied Air Forces missing from wartime operations had been accounted for. About 22,000 are outstanding, but between 12,000 and 17,000 are believed to have come down at sea.

Auxiliary and Reserve Forces

No. 601 Squadron.—Marshal of the Royal Air Force Lord Douglas of Kirtleside, G.C.B., O.B.E., has been appointed Honorary Air Commodore of No. 601 (County of London) Squadron, Royal Auxiliary Air Force, from 29th September, 1948. The Right Hon. Lord Riverdale, G.B.E., relinquished the post on that date on the expiration of his period of appointment.

Jets for Auxiliary Squadrons.—The first two squadrons of the Royal Auxiliary Air Force to be re-armed with jet fighters are Nos. 500 (County of Kent) and 605 (County of Warwick). Further squadrons will be similarly re-armed within the next few months

No. 500 Squadron, based at West Malling, near Maidstone, received Gloster "Meteors"; and No. 605, at Honiley, near Kenilworth, received de Havilland "Vampires." Both squadrons formerly flew de Havilland "Mosquitoes."

No. 615 Squadron.—New headquarters for No. 615 (County of Surrey) Fighter Squadron, R.Aux.A.F., were opened on 5th October at Croydon by Mr. Churchill, Honorary Air Commodore of the Squadron. He said that the auxiliary squadrons before the War were an addition to the country's somewhat straitened air resources. When war began the word "auxiliary" became not an apologetic or explanatory term, but almost an additional title to fame.

A.T.C. Cadets Visit Canada.—Twenty-five cadets of the Air Training Corps left Northolt on 6th August in a "North Star" aircraft of the Royal Canadian Air Force for a three weeks' visit to Canada. At Aylmer, Ontario, they joined Canadian cadets in summer training.

Observer Corps Camp.—Mr. Arthur Henderson, Secretary of State for Air, on 18th September, visited members of the Royal Observer Corps undergoing training in the first camp to be held by the Corps, at Thorney Island, near Portsmouth. He said that one of the lessons already confirmed as a result of the recent air exercises is that the human eye, the human ear, and the human brain allied together in the shape of the trained member of the Royal Observer Corps can play a part in the detection and recognition of the fastest types of modern aircraft which cannot be accomplished by any other means. "The advance of science," he added, "including the latest development of radar, most emphatically does not mean that the R.A.F. can dispense with your trained services; on the contrary, the human element and the scientific element are complementary, and broadly speaking, the human element comes first."

W.A.A.F. Mess Dress.—As a form of mess dress for officers of the Women's Auxiliary Air Force serving in home commands of the R.A.F., the King has approved the wearing of service dress with soft white shirt, semi-stiff turned-down collar and long black tie on all occasions when evening dress is appropriate and it is necessary or suitable that uniform should be worn. As in the case of the present form of mess dress worn by R.A.F. officers, this is an interim form only, and its wearing is optional until a decision is made on the question of the reintroduction of mess dress for the R.A.F.

Special Flights

Faster than Sound.—The Ministry of Supply announced on 10th September, that in the course of recent high-speed development trials on the de Havilland 108 research aircraft an apparent mach number in excess of 1, or faster than sound, had been recorded. (The mach number, which takes its name from a system devised by Dr. Ernst Mach, of Vienna, is a means of expressing speed in relation to the velocity of sound.) Mr. John Derry, the pilot, said his object was to obtain records similar to those obtained in a previous flight when he attained a mach number of .96. Between Windsor and Farnborough he put the aircraft into a steep dive. At an altitude of between 30,000 and 40,000 ft. his mach meter indicated that he had exceeded the speed of sound, which at that height was about 675 miles an hour. There was an automatic recorder on the mach meter and it was calibrated immediately after the aircraft landed.

Altitude Record.—The Royal Aero Club received notification in September from the International Aeronautical Federation (F.A.I.) that the international altitude record for aircraft set up by Group Captain John Cunningham—chief test pilot of de Havillands, on 23rd March, had been confirmed. Piloting a de Havilland "Vampire" jet fighter powered by a D.H. "Ghost" engine, he attained an altitude of 59,446 ft. (18,119 metres).

"Meteors" Visit Denmark.—The Gloster "Meteor IV"—the fastest jet fighter in the R.A.F.—gave displays of aerobatics at Copenhagen in connection with the British Exhibition which opened there on 18th September. Eight "Meteors" also made a formation flight over the city on the opening day.

"VAMPIRES" ATLANTIC CROSSING.—Lord Tedder, Chief of the Air Staff, on 26th August, sent the following message to Squadron Leader R. W. Oxspring, Commanding Officer of No. 54 Squadron, on the successful return of the squadron, after its double crossing of the Atlantic (see August JOURNAL, page 496) :—

"Good show. Congratulations. A good notch to add to 54's record."

DOMINIONS AND COLONIES

AUSTRALIA

STRENGTH.—In a discussion on the defence programme during the Budget debate, Mr. Dedman, Australian Minister of Defence, said that the strength of the Royal Australian Air Force in June was 8,000, compared with 13,100 to be attained.

CANADA

EXERCISES.—The Royal Canadian Air Force co-operated in exercises with the Royal Canadian Navy in September in Hudson Bay waters. Aircraft from a search and rescue flight at Greenwood, Nova Scotia, sought to intercept the warships on the outward and return trips. Ice reconnaissance flights were also made in the Hudson Strait area preceding the passage of the naval force.

NEW ZEALAND

RESERVES.—It was announced from Wellington on 14th September, that the New Zealand Territorial Air Force and Air Force Reserve are to be reconstituted, and training will begin during the last quarter of the year. The Territorial Force will have an ultimate strength of five squadrons, with 2,000 men, and the Active Reserve will be built up to 2,000.

FOREIGN AIR FORCES

HOLLAND

The Dutch air forces have reoccupied a number of air fields used by the *Luftwaffe* in the late war. Of these, Woensdrecht is allocated to *ab initio* training; for this Tiger Moths are used. Advanced training is carried out at Twenthe. Technical personnel are trained at Deelan. Gilze-Rijen is used for navigational, wireless and air-gunnery training.

The Royal Netherlands Navy is the principal Dutch purchaser of British aircraft and is considerably more up to date as regards types than the Army. Delivery has been taken this Summer of some 65 Firefly reconnaissance-fighters and 14 more were on order. A number of Hawker Sea Furies have also been acquired.

The Army Air Corps is equipped with a miscellaneous collection of war-time aircraft; operation squadrons are equipped with Spitfires and the U.S. Mitchells. It is intended to replace the former by Gloster Meteor F.M.K.N. fighters.

ITALY

According to a recent report in *Flight*, the well-known firm of Fiat is taking up the development of the gas turbine for aircraft.

A company, operating under the name of Turbogas, is co-ordinating commercial interests in this type of engine for industrial purposes.

RUSSIA

ANNUAL AIR SHOW.—The annual display of Soviet aircraft was witnessed by Marshal Stalin and a large party of the diplomatic corps when it took place this Summer over the Tushino airport.

According to American reports, many of the aircraft were of the same types as took part in last year's show; but there were some new and very fast jet aircraft. These included the Russian version of the D.F.S.-346, which is reported to have reached a speed of 748 miles per hour. The U.S. publication, *Aviation Week* claims to have secured a cinematograph film of this aircraft, from which detailed drawings of it have been pro-

duced. These show that there are two versions; both have swept-back wings, but one has a straight-through air flow with intake at the nose and outlet at the tail, the other has intakes on each side of the fuselage.

The Germans never finished the D.F.S.-346, but it was sufficiently developed to be of considerable use to the Russians when it fell into their hands after the War; moreover, it is reported that some 2,000 German experts and engineers under Dr. Hoffmann —Junkers' chief designer, are now working in Moscow.

FOUR-JET BOMBER.—Another new type of interest, some details of which are also given by *Aviation Week*, is a four-jet bomber of what is known as an Ilyushin design. In some respects, it resembles the Boeing X.B.-47; it has a very thin air-foil section and the engine nascelles are suspended from the wings. It has an unbroken contour from nose to tail, the pilot and co-pilot being housed in the nose section; provision is made for a tail gunner.

TRAINING.—The American observers who witnessed the Soviet Air Show, appear to have been much impressed by the high standard of training which the flying demonstrated. Especially noticeable was the development and handling of jet aircraft.

One of the finest episodes in the Show was said to be the performance of a formation of five jet aircraft, which carried out aerobatics at high speed with perfect timing.

UNITED STATES

COMMAND OF THE U.S.A.F. IN EUROPE.—Lieut.-General Curtis E. Le May, having been appointed Head of the U.S. Strategic Air Command, has been succeeded by Lieut.-General John K. Cannon as Commander of the U.S. Air Forces in Europe. The change of appointments was announced on 21st September.

STRATEGIC AIR COMMAND.—Inaugurated on 21st March last, the Strategic Air Command consists basically of the 8th and 15th Air Forces. One of its main objects is to develop the range of heavy bombers. Two B.-29 Superfortresses are reported to have made a flight recently of 5,000 miles, carrying 10,000 lbs. weight of bombs.

In addition to Superfortresses, S.A.C. is being equipped with the Convair B.-36 which, it is stated, "should assist in extending the range to the planned 10,000 miles."

The present establishment consists of 5,500 officers, 44,000 other ranks and 5,300 civilians.

NEW AIRCRAFT.—The U.S.A.F. will be strengthened by an order for a hundred more F.-80 C Shooting Stars, making nearly 600 to be added to the thousand with which six of the eight Fighter Groups are now equipped. (Note an article on "New American Jets" will be found in the *Aeroplane* for 15th October, 1948.)

Steps are also being taken to provide jet-bombers which will be faster and have a longer range than the Superfortress. An order has been placed for 162 B.-50's—a type which will be able to operate at higher altitudes where the jet fighters are not so effective.

Orders have also been placed for thirty B.-49 all-wing eight-jet bombers, and Boeings have been authorised to start production of their fast X.B.-47 six-jet light bomber.

RECRUITING.—Like the R.A.F., the U.S.A.F. has urgent need for more men. An appeal has recently been made for 10,000 pilots, navigators and ground staff to return to the Service; they are largely required to work on the Berlin "air lift" operation and to relieve those who have already completed their overseas tours of duty in Western Europe.

SUPERFORTRESSES IN EUROPE.—It has been announced that the number of Superfortresses to be maintained in Europe is to remain at 90.

These represent three bomber groups of Strategic Command. A group at a time will be flown home to the regular station in the United States, being relieved by another group. This "rotation programme," it is stated, is in accordance with training policy.

REVIEWS OF BOOKS

GENERAL

Napoleon's Memoirs. Edited by Somerset de Chair. (Faber & Faber.) 42s.

The edition of Napoleon's Memoirs under review is the first coherent and consecutive version which has appeared in this country. The Memoirs commence with a chapter on Corsica and continue until the end of the Marengo campaign. Then there is a gap until the escape from Elba. Though the Editor claims " to have done no more than present the self-portrait scientifically cleaned, and hung in a good light," the result is a fascinating study.

The Editor in his Introduction states: " Half of Napoleon is worth two of Hitler, and, in an age of *ersatz* Napoleons, the authentic voice is arresting. He need not fear comparisons." All this the reader must judge for himself, bearing in mind that Napoleon differed from his modern imitators in that he was a trained, experienced and successful professional soldier when he seized power.

Even in his early days Napoleon seems to have possessed a thorough understanding of the French soldier. He mentions that in 1791 revolutionary ideas began to prevail in the artillery regiment with which he was serving, and some of the officers emigrated. " Goubion, Vaubois, Dufour and I were the four Captains who, having preserved the good opinion of the soldiers, kept them within the limits of order."

The chapter on Toulon is of considerable interest. There are some political comments and a deal of scorn for the civilian " Generals " appointed by the Committee of Public Safety. But its main importance lies in showing Napoleon's careful reconnaissance, his organization of the artillery, and his choice of the method of attaining the object. Convinced that he was right, he also succeeded in getting his plan adopted. " It was at Toulon," he writes, " that my reputation commenced."

Napoleon joined the Army of Italy as " General of the Artillery " in 1794. He did not waste his time in the few months he held the appointment, and once more got certain of his plans for the improvement of the Army's positions put into effect. Appointed to command the Army of Italy after the 13th Vendemiaire, he found it in a shocking state, and at once set to work to improve matters, then issued the first of his famous proclamations which, strange as they may seem to us, had the desired effect on the French troops. The campaign of 1796 is described at some length, as are the operations which led to the Peace of Campo Formio. There is no undue modesty—he announced himself to be the Liberator of Italy—and he always appears self-confident. When the Directory ordered a ridiculous manœuvre after the battle of Lodi, Napoleon promptly resigned. At this the Government gave way and did not intervene again. In a chapter headed " Observations " he returns to the subject of interference with the Commander-in-Chief, and expresses views with which the professional officer will find himself generally in agreement.

Chapters XXIV to XXXI deal with the Egyptian adventure, and are not quite so interesting as might have been expected. The first chapter is a critical description of the Battle of Aboukir and contains the astonishing statement that: " the marine general needs but one science, that of navigation." The objects of the campaign are stated to have been to establish a French colony and to open a market for French goods; and, finally to secure a base for the invasion of India. In his apologia Napoleon claims that the first two objects were fulfilled, and gives his reasons for returning to France. But there is nothing in these chapters, or elsewhere in the Memoirs, to show that he ever appreciated the influence of sea power.

The Memoirs tell how Napoleon emerged from the revolution of the 18th Brumaire as First Consul, and how he flung himself into every form of activity, including preparations for the reconquest of Italy. Two chapters cover this campaign and the final victory of Marengo. The measures taken to mislead the Austrians before the spectacular advance through the St. Bernard are given in some detail.

The fantastic story of the march on Paris after the escape from Elba is famous. But the extraordinary feat of organization in expanding and equipping the army during the period March–June, 1815, clearly told in the Memoirs, is not so well-known.

Napoleon claims that Wellington and Blucher were surprised. This may be so, but the strategic success was not followed by the essential tactical victory. He accuses Blucher of breaking three rules of war, and criticizes his position at Ligny—Wellington, it may be remembered, was equally critical of it. According to Napoleon, Wellington should not have fought at Waterloo, and even in winning the battle he had done his country a disservice. Napoleon has nothing good to say about the " Sepoy General " the significance of whose tactics and use of ground he did not grasp. Many of his Marshals had learned something of Wellington's methods in the Peninsula, and fear of surprise may have been the cause of Ney's " stickiness " at Quatre Bras, and of some of the delays at Waterloo. In any case the staff work was not good, and the temper of the French army was not the same as of old.

The last chapters contain a number of inaccuracies and contradictions, and are a not very convincing attempt at vindication. But the Memoirs, nevertheless, are of absorbing interest, not so much as a narrative of events, but as a study of character.

Gallipoli Mission. By C. E. W. Bean. (Canberra, Australian War Memorial.) 25s.

Mr. Bean was formerly the Australian Official War Historian. He here tells us the story of a trip to Gallipoli undertaken by himself and a few companions in 1919. The visit was made mainly for research purposes, and the results of this research were of considerable assistance to the author when compiling his subsequent official history of the Gallipoli campaign of 1915.

The book is well produced, most readable and includes numerous illustrations and maps, together with Appendices and a good Index.

NAVAL

The Influence of Sea Power on the History of the British People—The Lees Knowles Lectures for 1947. By Admiral Sir William M. James, G.C.B. (Cambridge University Press.) 4s. 6d.

These three Lees Knowles lectures deserve a much wider public than the audience to which they were delivered, for they describe in simple language, yet with colourful phraseology the ingredients and importance of sea power. Indeed, this is the sort of book one would like to think will find a place in most colleges and the more senior schools, for it deals with matters which should be part of the education of every British man and woman.

The first lecture deals with sea power as it operated in the days of sailing fleets. The last shows how it was still the fundamental factor in the mechanical age of the last two great wars. Admiral James comes down to bedrock in his concluding paragraph when he says that, despite the development of weapons, there are " two unchangeables—the infantry soldier and the merchant ship," and " on that ship our existence depends." In other words " her voyages both homeward with food and raw materials and outward with soldiers " are the outward and visible sign of sea power.

The main theme of the lectures, as he says in his Preface, is that " throughout history four elements have conferred the power to control the sea routes—merchant ships, bases, weapons and skilled men. . . ." In order to bring out the importance of the fourth element, he has devoted his second lecture to Nelson, as the highest embodiment of leadership and fighting qualities. Admiral James is always at his best in his pen portraits and, if this is necessarily rather an outline sketch, it is a human and arresting one; but what makes him say " Sir William Hamilton's death had left him (Nelson) free to marry Emma " ? There had been no divorce and Lady Nelson lived until 1831. This, in any way, is as bad a mistake in a Nelson biography as Dr. Dalton's assertion, when he was presenting the bill to end the pension attaching to the peerage that the great Admiral's natural daughter Horatia had no children.

Portsmouth Point—The Navy in Fiction, 1793–1815. By C. Northcote Parkinson. (Hodder and Stoughton, Ltd., London.) 12s. 6d.

This is a collection of sketches of the Navy—its ships, life and characters, in the late XVIIIth and early XIXth Centuries, culled from the writings of such authors as Marryat, Chamier, Davis, Glascock, Howard, Neale and Hannay, also from other light works on the period, either anonymous or written under pseudonyms. The chapters deal with such subjects as "The Man-of-War," "Officers," "Midshipmen," "The Crew," "Food," "Naval Dialect" and end with one of "Anecdotes."

The illustrations include reproductions of Rowlandson's drawings, photographs of paintings and models and a number of line drawings, all well in keeping with the letter-press. The frontispiece, which in a larger reproduction also forms the attractive wrapper, is the Rowlandson picture from which the book takes its title. There is also a short glossary of technical words and naval slang.

A most entertaining little volume—this is a worth-while addition to the lighter and brighter side of naval literature.

The Navy of Britain—A Historical Portrait. By Michael Lewis, M.A., F.R.Hist.S (George Allen and Unwin). 30s.

In this book, Professor Lewis has set himself to write a History of the Navy of Britain, not a Naval History of Britain. He is at pains to emphasize the distinction, but questions whether it is over-subtle. Such doubts, however, are swept away by the book itself, which presents a clear and vivid picture of how the Navy first started and how down through the years it was formed, manned, directed, administered and fought.

The first part deals with the origins of the Navy, which the author defines as having developed into a "Permanent, National, Maritime Fighting Force"; he discusses when it can first be so described. He portrays its growth from the old levée-en-masse of shipping by the Crown in an emergency, making an interesting analogy here with the rapid collection of the little ships for the evacuation of Dunkirk. He points out that it was the need for trade protection which brought out the first fighting ships and caused the growth of the Navy. History shows that a navy without adequate trade to protect will wilt away, just as seaborne trade without a strong navy will disappear. In discussing who can be said to be "The Father of the Navy," the claims of Alfred, Edward III and Henry V, and later of Henry VII, Henry VIII, and Elizabeth are given, but it was not until the times of the Stuarts and the Commonwealth that a "Permanent, National, Maritime Fighting Force" really began to show itself, and not until after the Restoration did it clearly emerge. To Charles II, therefore, is given the credit of having been "The Father of the Navy."

The second part of the book deals with the ships and shows the evolution of the man-of-war: from galley to merchant ship and round ship, from round ship to ship-of-the-line, and then during the second great transition from sail to steam, from wood to iron, and from broadside gun to turret. It is interesting to see it so clearly brought out that it was not only her good sea-keeping qualities that led the English to turn to the round ship from the galley, but the fact that when not wanted for war the round ship could be used for commerce, for profit.

The next two parts, on the development of the officers and men that fought these ships, are in many ways the most interesting of the book. Dealing with the officers, Professor Lewis refers to the early division between the seamen who sailed and cared for the ship—the mariners, and those who fought the ship—the gentlemen, and discusses who are their descendants to-day. It is interesting to see Hawkins and Drake placed squarely as ancestors of the R.N.R. officer and Grenville as an ancestor of the R.N.V.R. officer. The men are also divided into seamen and non-seamen, the seamen being the ancestors of the regular R.N. ratings of to-day; the non-seamen soon disappeared when the officer "fighters" no longer brought their men-at-arms to sea, but reappear in our day as the modern "Hostilities Only" ratings. Pepys' great share in the development

of naval organization and training is clearly brought out, as is the part he played in the Management, Direction and Administration of the Navy, which are dealt with next.

Professor Lewis provides us with a most interesting review of Tactics, with interpolations on the development of weapons. He traces the evolution of sailing-ship tactics from the days of man-killing weapons and the ram, through the early attempts at tactics in the times of the Tudors and Elizabeth, through the formalism of the XVIIth and XVIIIth Centuries and so to the heyday of sailing-ship fighting from 1794–1805, and the great victories of Howe, Jervis and Nelson. Coming to later times we are given a very summarized version of Jutland, while a bare three pages are devoted to sea action during the late war. Here one gets the impression that the author feels he may find himself out of his depth if he does more than record simple facts.

The book finishes with two pages on morale. To quote the last words " These stories of individual gallantry are the outward and visible signs of an inward and spiritual quality—that ' morale ' which is, throughout its long story, both the mainspring of our Navy's strength and the prime cause of its success."

No review of this publication would be complete without mention of the illustrations, which are numerous, well-chosen, beautiful and well-produced. It is refreshing to find such a book so lovingly illustrated.

This is but an incomplete picture of a fine work. The only criticism which can be made of it is that the author is less happy and sure of touch in writing of modern days than he is in dealing with those of old ; but he has painted a live and fascinating picture of the origins and growth of the Navy, and provided a notable addition to the historical literature of the Service.

ARMY

The Indian Sappers and Miners. By Lieut.-Colonel E. W. C. Sandes, D.S.O., M.C., R.E. (Ret.) (The Institution of Royal Engineers, Chatham.)

The inability of the Infantry to overcome an enemy entrenched behind apparent impossible obstacles or fortifications, brought about the necessity of employing in an army skilled personnel able to use mechanical or technical means of assisting the foot soldier to victory. This book tells the story up to the outbreak of the War of 1939 of the three military Engineer Corps of what was the Army of British India, and their achievements towards that end, during the best part of two centuries, over a large portion of the terrestrial globe.

These three Corps—Queen Victoria's Own Madras, King George V's Own Bengal, and the Royal Bombay—of Sappers and Miners, until amalgamated into the Corps of Indian Engineers in 1941 to become the Royal Indian Engineers five years later, had maintained separate entities, each having their own distinctions, badges and battle honours ; but, as the author explains, the three Corps shared in so many campaigns that a combined history of the engineer soldiers of India was the only effective way to record their deeds and campaigns : which the author definitely does in a manner of interest to soldier or civilian. He also touches on the story of the Sappers maintained by the Princes.

Few people appreciate that prior to the 1914–18 War, the Regular Sappers and Miners of India had taken part in campaigns, major and minor, outside of the borders of that great sub-continent, as far apart as the Philippines and West Africa. One Corps—Madras—has the honour of the Sphinx superscribed Egypt for services on the Nile before Nelson fought Trafalgar.

The part played by the Indian Sappers in all the campaigns in which they were engaged is clearly described, and favourable fresh light is shone on the doubtful behaviour of some of the Bengal Corps in 1857.

There is a summary of the North-West Frontier wars, with a picturesque account of the tribal inhabitants and the countryside, which effectively illustrates to those who have never been there the hardships inherent with soldiering in those parts.

To those who served against the Italians in Abyssinia in the recent War, the chapter on the campaign in that country in 1867, in which the Madras and Bombay Corps played a strong part in what was decidedly an engineers' war, will not fail to be of interest.

The author tells concerning the International Expedition to China of 1900–01 that "The Russians were difficult neighbours. They tried to obtain entire control of the Railway and were always encroaching on the British section . . . They occupied the Summer Palace (of Peiping) and held it for two months, contrary to agreement, to the exclusion of the other Allies."

The book is well-produced for these times; is illustrated by pictures—some unique, and by sketch maps on a scale which enables them to be understandable for their purpose; there is a copious index, though one would have thought that the page about the famous *Bangalore Torpedo* and other well-known inventions of the Madras Sappers would have found a place in it; the sources of information are given by footnote; there are nine Appendices which give detailed information which would not be appropriate in a general historical chronicle. There are some minor omissions in regard to other regiments, but this does not affect the general accuracy of the narrative, though it may serve to annoy old comrades-in-arms. The spelling of the place names follows the *Imperial Gazetteer of India* and thus to read of *Khaibar* and *Mahratta*, etc. when other forms have long been in use, is disconcerting.

The reader learns that mechanization displaced the last elephants in the Indian Army in 1931, but he will find no mention of the Victoria Cross earned by Prendergast of Madras during the "troubles" of 1857–58.

It is a pity in a work of this kind that there are not illustrations of uniforms and badges; the cover shows the badge of the Royal Engineers.

There are no references to *gymnkhana* events so often featured by Indian regimental histories which is perhaps to the good, even so, the author deplores that owing to space limitations he was not able to describe the record of the three Corps in the field of sport.

Colonel Sandes concludes by writing "From the days of the Indian Mutiny till recent times, it has been the privilege of Royal Engineer officers to lead and command the Engineer field units of India; and as in the process of political evolution, that honour has now passed to men of Indian blood, they trust that the high standards of this branch of the Dominion forces of India will be maintained as fully as in the late World War." He does not, however, mention that the first Victoria Cross won by an Indian in World War II went to Lieutenant Premindra Sing Bhagat of the Royal Bombay Sappers and Miners, in Abyssinia, for one of the longest-continued feats of sheer cold endurance ever seen.

Lieutenant-General Sir Ronald Charles, K.C.B., C.M.G., D.S.O., a former Chief Royal Engineer in India and a Bengal Sapper writes a lengthy, most interesting and informative foreword covering the whole scope of the book which should find a place in all military libraries as a record of the contribution of the "Sapper from Chatham" to the history of all India and the fame of the martial sons of her soil.

The Canadian Army, 1939–1945. An Official Historical Summary. By Colonel C. P. Stacey, O.B.E., A.M., Ph.D. (H.M. Stationery Office.) 12s. 6d.

This book is published under the authority of the Canadian Minister of National Defence. The author (who is Director, Historical Section, General Staff, Army Headquarters, Ottawa) writes in his Preface that "this volume has been prepared in order that the people of Canada may have in their hands at as early a date as possible an authentic comprehensive outline of the work of their Army in the War of 1939–1945. . . . In the nature of things, this account . . . cannot be definitive. It is an interim report. . . ."

As such, the book is an excellent production. It is sufficiently comprehensive, clear and readable. There are a number of illustrations—reproductions of paintings by Canadian war artists. The maps are good, and there is an adequate Index.

REGIMENTAL HISTORIES

The Suffolk Regiment, 1928–1946. By Colonel W. N. Nicholson, C.M.G., D.S.O. (East Anglian Magazine, Ltd., Ipswich.) 21s.

The author, who was Colonel of the Regiment from 1939 to 1947, has here compiled a full and comprehensive history.

The 1st Battalion served in France and Belgium, 1939–40, and shared in the Allied invasion of North-West Europe from D-day until the capitulation of Germany. The 2nd Battalion, which was in India at the beginning of the War, later took part in the Burma campaign. The 4th and 5th Battalions, and also the two battalions of The Cambridgeshire Regiment, had the misfortune to be captured at Singapore. The 7th Battalion, which in 1941 was converted into the 142nd Regiment, R.A.C., served in Tunisia and Italy.

One chapter is devoted to the second line battalions and another deals with the Home Guard, Army Cadets and A.T.S.

There are numerous Appendices, good sketch maps and many photographic illustrations. Altogether, this is a handsome volume which will appeal to all connected with The Suffolk Regiment. All profits from its sale are being given to the Suffolk Regiment Old Comrades Association.

The History of The 2nd Canadian Battalion (East Ontario Regiment), Canadian Expeditionary Force. By Colonel W. W. Murray, O.B.E., M.C. (Published by the Historical Committee, 2nd Battalion, C.E.F., Ottawa, November, 1947.)

This history of a famous Canadian battalion in the War of 1914–18 is thorough, impartial and well written, with numerous and excellent skeleton maps to elucidate the text. The book is very well-produced.

Appendices include a nominal roll of every man who served in the battalion, and also a detailed list of casualties. Between September, 1914, and demobilization in April, 1919, 242 officers and 5,084 other ranks passed through the Battalion; of these, 52 officers and 1,227 other ranks became fatal casualties.

A Distant Drum. By Captain J. Pereira. (Gale and Polden, Ltd.) 21s.

The sub-title of this book is: "War Memories of the Intelligence Officers of the 5th Battalion, Coldstream Guards, 1944–45."

The author was with this battalion throughout the campaign in North-West Europe, from its arrival in Normandy a fortnight after D-day until the German surrender. In his Introduction he says:

> ". . . A formal Battalion history is bound to be a dull simulacrum even for those who can read between the lines, and it is the hope of this book that by presenting a version which is strictly personal and unofficial it may be possible to give some life to what would otherwise be dry bones. . . ."

Captain Pereira has succeeded admirably in his endeavour, and the book is full of human interest.

Appendices include a Roll of Honour, orders of battle on various dates, and citations giving details of how honours and awards (including one Victoria Cross) were earned.

General Sir Charles Loyd, K.C.B., K.C.V.O., D.S.O., M.C., Colonel, Coldstream Guards, contributes a Foreword.

AIR

Laboratory of the Air. By John Pudney. (H.M. Stationery Office.) 3s. 6d.

This is a brief history of the Royal Aircraft Establishment of the Ministry of Supply at Farnborough. The narrative has been compiled from personal interviews and from official documents. It may be described as an outline (for popular consumption) of the development of aeronautical science in England.

The book is well written, with a light touch, and is most readable. It should appeal and be informative to the younger generation of officers of all Services. The numerous photographic illustrations are excellent.

ADDITIONS TO THE LIBRARY

(*Books for Reference in the Library only.)

GENERAL

*Statesman's Year-Book, 1948. Statistical and Historical Annual of the States of the World for the year 1948. Edited by S. H. Steinberg. Crown 8vo. 1471 pages. (Macmillan 1948.) 32s.

The Second World War. Volume I—The Gathering Storm. By Winston S. Churchill. Demy 8vo. 612 pages. (Cassell 1948.) 25s.

The Sinews of Peace. Post-War Speeches of Winston S. Churchill. Demy 8vo. 256 pages. (Cassell 1948.) 16s.

Last Viceroy. The Life and Times of Rear-Admiral the Earl Mountbatten of Burma. By Ray Murphy. Medium 8vo. 270 pages. (Jarrolds 1948.) 21s.

Napoleon's Memoirs. By Somerset de Chair. Demy 8vo. 605 pages. (Faber and Faber 1948.) 42s. Presented by the Publishers. (See Review in this Journal.)

War Between Continents. By F. O. Miksche and E. Combaux. Demy 8vo. 211 pages. (Faber and Faber 1948.) 15s. Presented by the Publishers. (See Review in this Journal.)

Major Problems of United States Foreign Policy 1947. A Study Guide. Demy 4to. 303 pages. (The Brookings Institution, Washington, U.S.A. 1947.) $3.

The Twenty Years' Crisis 1919-1939. By E. H. Carr. Demy 8vo. 244 pages. (Macmillan 1948.) 12s. 6d.

Soviet Communism: A New Civilisation. By Sidney and Beatrice Webb. Medium 8vo. 1007 pages. (Longmans, Green 1944.) 30s.

How to Stop the Russians—Without War. By Fritz Sternberg. (Translated from the German by Ralph Mannheim.) Crown 8vo. 159 pages. (Boardman 1948.) 7s. 6d.

*Documents on British Foreign Policy 1919-1939. Second Series. Volume III—1931-1932. Edited by E. L. Woodward and R. Butler. Royal 8vo. 617 pages. (His Majesty's Stationery Office 1948.) 21s.

All the Cards on the Table. Foundations of British Foreign Policy. By Jack Cherry. Demy 8vo. 135 pages. (Museum Press 1948.) 7s. 6d.

The author tries to show that any contribution British Foreign Policy may have had to the outbreak of war in 1914 and 1939 was the result of departures from principles which can be ignored only at our peril, and he considers the disastrous results of allowing foreign policy to be confused with party politics.

There Will be No Time—The Revolution in Strategy. By W. L. Borden. Demy 8vo. 225 pages. (The Macmillan Co., New York 1946.) $2.50.

Democracy and Its Rivals. An Introduction to Modern Political Theories. By Christopher Lloyd. Crown 8vo. 199 pages. (Longmans 1946.) 5s.

The Three Corners of the World. An Essay in the Interpretation of Modern Politics. By Paul McGuire. Demy 8vo. 299 pages. (Heinemann 1948.) 15s.

An argument for the Empire system, with its history and relationship to the world situation of to-day.

Western Union. United Nations Association's Guide to European Recovery. Crown 8vo. 183 pages. (Hutchinson for the United Nations Association 1948.) 10s. 6d.

The Australian Economy in War and Reconstruction. By E. Ronald Walker. Demy 8vo. 426 pages. (Oxford University Press 1947.) 30s.

LAND LOOKING WEST. The story of Governor James Stirling in Western Australia. By Malcolm Uren. Demy 8vo. 316 pages. (Oxford University Press 1948.) 21s.

THE GOAL OF BRITISH RULE IN INDIA. By R. Coupland. Pamphlet. 22 pages. (Longmans 1948.) 1s.

THE BRITISH ACHIEVEMENT IN INDIA. By H. G. Rawlinson. Large Post 8vo. 248 pages. (Hodge and Co. 1948.) 15s.

MY INDIAN YEARS 1910-1916. By Lord Hardinge of Penshurst. Demy 8vo. 150 pages. (Murray 1948.) 10s. 6d.

CHINA CHANGED MY MIND. By David Morris. Crown 8vo. 202 pages. (Cassell 1948.) 8s. 6d.

THE MAKING OF MODERN HOLLAND. A Short History. By A. J. Barnouw. Crown 8vo. 224 pages. (Allen and Unwin 1948.) 8s. 6d.

THE PHOENIX CUP. Some Notes on Japan in 1946. By John Morris. Demy 8vo. 224 pages. (The Cresset Press 1947.) 12s. 6d.

MALAYA AND ITS HISTORY. By Sir Richard O. Winstedt. Crown 8vo. 158 pages. (Hutchinson 1948.) 7s. 6d.

POLAND, OLD AND NEW. By W. J. Rose. Demy 8vo. 354 pages. (Bell 1948.) 26s.

SLEEPLESS SPAIN. By Victor Alba. (Translated by Charles Duff.) Crown 8vo. 207 pages. (Cobbett Press 1948.) 8s. 6d.

THE ARABS. A Short History. By Philip K. Hitti. 206 pages. (Macmillan 1948.) 10s. 6d.

Professor Hitti's "History of the Arabs" has been for several years past a standard work; the present volume is an abbreviated version of it.

LIMELIGHT FOR SUEZ. By Claude Dewhurst. Crown 8vo. 134 pages. (Schindler, Cairo 1948.) 50 Pt. Presented by Commander G. M. Bennett, D.S.C., R.N.

TITO'S REPUBLIC. By Monty Radulovic. Demy 8vo. 241 pages. (Coldharbour Press 1948.) 12s. 6d.

THE RISE OF THE SPANISH AMERICAN EMPIRE. By Salvador De Madariaga. Medium 8vo. 408 pages. (Hollis and Carter 1947.) 21s.

THE FALL OF THE SPANISH AMERICAN EMPIRE. By Salvador De Madariaga. Medium 8vo. 443 pages. (Hollis and Carter 1947.) 21s.

DAWN OVER ZERO. The Inside Story of the Atomic Bomb. By William L. Lawrence. Demy 8vo. 251 pages. (Museum Press 1947.) 15s.

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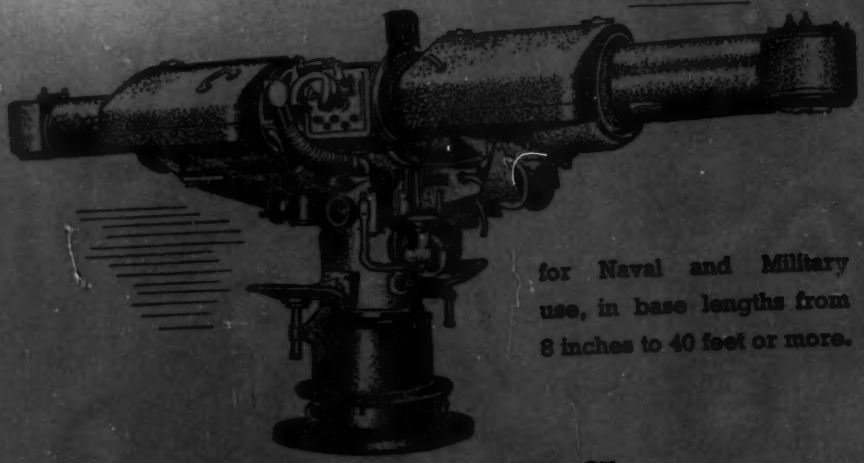

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